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GRUBER'S APPARATUS FOR RAISING WATER BY PNEUMATIC PRESSURE.

It is the custom where a water supply does not extend to the upper stories of buildings, to place tanks either upon the roof or some elevated place, and fill these tanks by means of pumps or some kind of forcing apparatus, but this plan is open to many objections, and to remedy these by dispensing with the tank entirely is the object of the invention represented in the accompanying engravings, in which Fig. I is a side view of the entire apparatus in position for use, and Fig. 2 a detached vertical section of one portion of the same.

A represents the spring or well, from which the water is to be drawn, and which has placed therein a strong sheet-metal reservoir, B, furnished at its lower end with a tubular neck or opening, *a*. The bottom of the neck, *a*, is covered with wire cloth or netting, *b*, and the top is furnished with a valve, *c*, opening upward. Extending upward from the upper end of the reservoir, B, is pipe, C, for the passage of air; the pipe, C, communicating with an air-reservoir, D, which, as shown in the engravings, is upon an upper floor, the pipe being furthermore furnished with a suitable stop-cock, *d*. E shows an outlet water-pipe, the lower point of which, fitting through the upper end of the reservoir, B, extends nearly to the bottom thereof, as shown in Fig. 2. This pipe, E, is extended upward to the required height, and is furnished with a suitable cock, *e*, to allow, when desired, the passage of the water through the same from the reservoir, B, and has furthermore attached thereto, at suitable points, any desired number of flexible branch pipes, F, which, by simply turning a cock, *f*, may be employed for throwing water in any direction. The air-reservoir, D, is made of sheet-metal, and is designed to correspond in shape and size with the reservoir, B, and is furnished with a safety valve, G, in order to relieve the same when the pressure of the air condensed therein becomes greater than is required or desirable. The air is supplied to the air-reservoir by a double pump, H, connected therewith by a pipe, J, and worked by a suitable lever handle, *k*.

The operation of the invention may be briefly described as follows: Air is forced into the air-reservoir, D, by means of the pump just mentioned, to any suitable or desired pressure, whereupon the air-reservoir is shut off from the pump by turning a valve, *m*, in the pipe, *g*. In the meantime the air having been at the ordinary pressure in the reservoir, B, the water lifting the valve, *c*, passes up into the said reservoir to the same level as that in the well or spring, in which the latter is placed, by turning thecock, *d*, in the air-pipe, C, to permit the compressed air to pass into the reservoir, B, and turning the cock, *e*, to allow the passage of the water through the outlet-pipe, E. The pressure of the compressed air upon the water in the reservoir will force the water upward through the water-pipe to a height proportioned to the pressure just described upon the water in the reservoir, the downward pressure of this water upon the valve, *c*, being sufficient to hold it to its seat, and thus prevent the escape of the water at the bottom of the reservoir. The water may be withdrawn from the pipe, E, at any desired point for occasional use by means of suitable taps in the same manner as when supplied from a tank, and when desired may be used in jets or in spraying, through the agency of the flexible branch-pipe, F, as herein before indicated.

After the water has been wholly expelled from the reservoir, B, and it becomes necessary to refill the same, a cock, *n*, provided in the air-reservoir, is opened to permit the escape of air through the pipe, C, and the air-reservoir, whereupon the water in the well or spring, A forces upward the valve, *c*, and passes into the reservoir, B, refilling the same to the same height as that in the well, so that by closing the cock, *n*, and again compressing the air in the air-reservoir, the forcing operation may be repeated. It will thus be seen that water may be supplied to any height in a buildidg, either for ordinary or occasional use, or to meet the exigencies of fire or other requirements, without any of the objections attendant upon the use of a tank upon the roof.

It is not necessary that the well or fountain of supply should be in immediate contiguity to the building, but may even be at considerable distance therefrom.

Although this invention was patented in 1864, it is only within a few months past that the inventor, Mr. John P. Gruber, has erected one at his establishment, Nos. 182, 184 and 186 Chatham street, New York City, where it may now be seen in operation. In this building the Croton seldom rises above the second floor during the day, but by the assistance of this apparatus, working at a pressure of from 15 to 20 lbs. to the square inch, water may be thrown quite over the roof.

Fig. 1

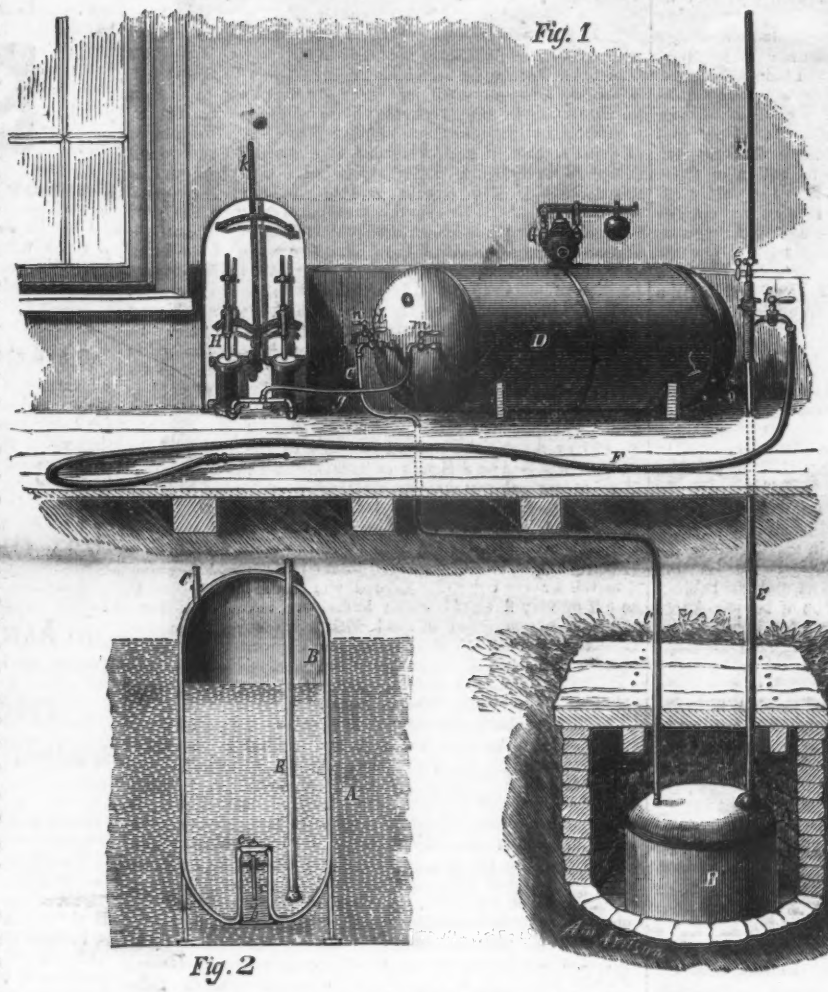

Fig. 2

GRUBER'S APPARATUS FOR RAISING WATER BY PNEUMATIC PRESSURE.

Formation of Gold Nuggets in Auriferous Drifts.

At a meeting of the Royal Society of Victoria, Mr. Cosmo Newberry read the following paper, On the Formation of Gold Nuggets in the Auriferous Drifts:—

"At the meeting of the society in September, 1866, Mr. Charles Wilkinson read a paper with the same title as the one I now propose to read, in which he stated that I was carrying out a series of experiments based on the interesting discoveries he had made. Before describing my experiments and results, it may be well for me to give an abstract of the arguments used against the denudation theory, and in favor of what seems to some a rather ludicrous idea—the growth of nuggets in the drifts. Through the kindness of Mr. Ulrich, I have been able to read over the latest idea of the eminent chemical geologist, Prof. Bischoff, on this subject, which I shall freely quote.

That some portion of the gold found in the auriferous drifts has been derived from the quartz reefs at the same time that the drifts themselves were formed, there can be no doubt. But the very marked difference between much of the reef gold and the drift gold tends to make us believe that this portion of it had some other origin, or was transferred from the reefs to the drifts by some means other than denudation. And when we consider that the nuggetty gold consists of nearly the heaviest known matter, offering but a very small surface of attack when compared with the other constituents of the drifts, it appears strange that they should be found at a great distance from any known reefs, as nearly all the large nuggets have been. Some of them are found in the sand overlying the gravel, which is quite inexplicable, remembring their weight and the otherwise regular arrangement of the deposit from the surface downwards—first clay, then sand, and fine and coarse gravel. These objections to the denudation theory are not easily explained away. Added to which is the fact that gold is contained in the iron pyrites found in the drifts, assuming the form of roots and branches of trees, and also replacing and impregnating the carbonaceous matter of the drift wood. This proves that the gold did exist inthe meteoric water which circulated through the drifts and deposited iron pyrites at a comparatively recent date. Based upon these arguments, Mr. Selwyn some years ago advanced the hypothesis that nuggets may be formed, and that particles of gold may increase in size, through the deposition of metallic gold from the meteoric waters percolating the drifts, which waters, during the time of our extensive basaltic eruptions, must have been of a thermal and probably of a highly saline character, favorable to their carrying gold in solution. As Mr. Ulrich points out in his essay on the Mineralogy of Victoria, this view of the character of the meteoric water in earlier times receives proof from the fact that on our western gold fields only, where tremendous abasltic eruptions have taken place, all the large nuggets have been found; while on the eastern and northern fields, where basaltic rocks are wanting, or of very limited extent, the gold is usually fine, and nuggets above an ounce or two in weight very rare. That gold does exist in solution in some saline waters at the present day has been proved by analysis, and Mr. Daintree, I believe, found gold in solution in water taken from a mine in this colony. Further proof of gold having been in solution at a comparatively recent date, I found when examining the pebbles of the miocene drifts. These rounded quartz pebbles are often coated over and cemented together by brown iron ore, in which I found gold, while I never could discover any in the pebbles. What the gold salt was, whether a chloride, silicate, or sulphide, we have no means at present of ascertaining, and as it may have been in the same solution that deposited the pyrites, which probably contained its iron in the form of protocarbonate with sulphates, it was not easy at first to imagine any ordinary salt of gold existing in the same solution as a protosalt of iron; but this I find can be accomplished with very dilute solutions, in the presence of an alkaline carbonate and a large excess of carbonic acid, both of which are common constituents of mineral waters, especially in Victoria. This is true of chloride of gold, and if the sulphide is required in solution, it is only necessary to charge the solution with an excess of sulphuretted hydrogen. In this manner both sulphides may be retained in the same solution, depositing gradually with the escape of the carbonic acid. Prof. Bischoff has suggested the occurrence of sulphide of gold in meteoric waters, and by experiment he found that it was slightly soluble in pure water. Once formed and present in the water, it is, like all other gold salts, easily decomposed. In an experiment I have made, the sulphide of gold was held in solution by a small quantity of an alkaline bicarbonate. A cube of iron pyrites and a chip of wood were introduced, and in a few days small irregular grains of metallic gold were deposited on the pyrites. What part the organic matter took in the reaction is not clear, but the gold was not deposited in the absence of it. In Mr. Wilkinson's paper a series of experiments are described in which gold was deposited in the

metallic form upon a nucleus from a solution of the chloride by the reducing agency of organic matter—the nuclei being either gold itself or iron, copper, and arsenical pyrites, galena, zinc blende, sulphide of antimony, &c. Organic matter has long been known as an agent for precipitating gold in the metallic state from its solutions. Rose states that oxalic acid precipitates it in metallic laminæ. This I have failed to produce. When boiled with a solution of chloride, I got purple and red precipitates, but when allowed to remain at the temperature of air for some hours, a film of gold floated on the surface of the liquid, and the bottom sides of the vessel were gilded. Tartaric, citric, and other organic acids have much the same effect. With wood, bark, charcoal, and like substances the reduction is much slower. No carbonic acid is seen rising, and the gold is deposited in the pores of the reducing agent, if the solution is dilute. But it was not known until the experiment of Mr. Daintree, and the following ones made by Mr. Wilkinson, that the deposit would take place on a nucleus, and be continued as long as gold remained in solution. If their action went on in the drift it would account for the greater purity of the gold, and for the nucleus of brown iron ore so often found in nuggets and crystals. Strong solutions of gold immediately begin to decompose the pyrites, and interfere with the regular deposition of gold by a strong solution. I refer to one containing more than one grain of chloride of gold to an ounce of water. A weaker solution than this also decomposes the pyrites, but so slowly as not to interfere with the deposit taking place regularly. All the other sulphides are al o decomposed. In the experiment in which galena was used as a nucleus, this decomposition was best marked. Somewhat more than a year ago, I placed a cube of galena in a solution of chloride of gold, with free access of air, and put in organic matter. Gold was deposited as usual in a bright metallic film, apparently completely coating the cube. After a few months the film burst along the edge of the cube, and remained in this state, with the cracks open, without any further alteration in size or form being apparent. Upon removing it from the liquid a few days ago, and breaking it open, I found that a large portion of the galena had been decomposed, forming chloride and sulphate of lead and free sulphur, which were mixed together, encasing a small nucleus of undecomposed sulphide of lead. The formation of these salts had exerted sufficient force to burst open the gold coating, which upon the outside had the mamillary form noticed by Mr. Wilkinson, while the inside was rough and irregular, with crystals forcing their way into the lead salts. Had this action continued undisturbed, the result would have been a nugget with a nucleus of lead salts; or, if there had been a current to remove the results of the decomposition, a nugget without a nucleus of foreign matter. If, instead of galena, we had had a piece of pyrites to start with, the decomposition would have gone on in the same way, but the result would have been brown iron ore in place of lead salts. This decomposition gives a very simple means of accounting for the oxide of iron so often found in the nuggets and crystals of gold, the latter especially, as shown by the experiments of the late Dr. Becker, by cutting them in halves, and by their established low specific gravity, and their loss in weight suffered in smelting. Finding the brown iron ore of the miocene drifts contained gold, I was led to suppose that, though I could not make gold deposit on it, I might succeed in making them deposit together, which was the case. I arranged a mass of sand with chips of organic matter in it in a vessel, and slowly filtered through it a dilute, nearly neutral solution of sesquichloride of iron, containing a few drops of chloride of gold, an as itd passed through repeated the dose. This continued for some weeks without any appreciable change taking place, but after some months thin bands of hydrated sesquioxide of iron began to form across the mass about the centre, parallel with the surface; as they increased in size they assumed a botryoidal appearance like the "ferro-manganese ore" which occurs in the quartz reefs, and in many parts were coated with a bright film of metallic gold; every further addition of the mixed solution produced another layer of oxide and gold, so that in time it appeared stratified. If the gold had been continued alone, after once having started its deposition, the result would have been the same as in the case of the decomposition of pyrites.

On the other hand, if the iron solution was in excess after a deposit of gold had been formed, it would have produced what is so often found in the alluvial workings, a nugget coated with iron ore, commonly known as "black gold." This mixed solution is one which we would not expect to find in nature, but there is no difficulty in supposing the transfer of gold with iron that would deposit as oxide, even if we need to introduce carbonic acid. If a solution of sesquichloride of iron and chloride of gold are heated together, the whole of the gold, in a very finely divided state, with a portion of the iron as sesquioxide, is deposited in a brownish yellow precipitate. Though the processes I have described will account for the formation of nuggets, it does not account for the appearance of gold in pyrites. I have examined about 100 samples, in none of which do I find any tendency on the part of the gold to assume the form of a coating, it being usually in irregular grains and small octahedral crystals, seldom to be detected even with the aid of the microscope, until nearly all the pyrites have been oxidysed and decomposed; in a few exceptional cases pieces have been found projecting, but all tends to prove the priority of the deposition of the gold, and that instead of pyrites having formed a nucleus for the gold, the reverse has in a majority of instances been the case. It may also have been the first to deposit in the drift wood, for in all the experiments by Mr. Wilkinson and myself, the organic structure became so impregnated with gold that when ignited (so as to burn off the undecomposed organic matter) a golden model remained. This, which fell into some of my experiments, and were useful in keeping up a supply of fresh organic matter, became so thoroughly impregnated that in some cases the finest hairs on their backs and legs were to be seen in bright gold after ignition. Conditions such as these (before ignition) would be very favorable to the formation of pyrites, offering to a ferruginous water containing sulphates a reducing agent and a congenial nucleus for the crystals to form on. Crystalline gold is very easily made by simply introducing a chip of wood into a solution of chloride of gold containing 5 or 6 per cent. of the salt. The crystals are first seen on the surface of the liquid as a thick film, which, as it grows heavier, falls to the bottom, where it assumes a moss like appearance.

If this is examined under a microscope, it will be found to be a network of octahedral crystals, resembling very closely the gold crystals from pyrites. Those crystals have been repeatedly made, carefully closing the vessel, so that no dust may enter, and, falling on the surface, form nuclei for them. With these crystals I sometimes found irregular pieces of gold, some in places showing planes of octahedrons. In these experiments, as in all others, organic matter is necessary, the action ceasing when it is removed, starting again immediately with fresh addition. These experiments are based on the assumption that the gold exists in the pyrites in the metallic form, and not as sulphide, as has been supposed to be the case by some. Mr. Daintree got gold in solution by digesting some of the pyrites from clunes in sulphide of ammonium, but I have always failed to prove the presence of it as negative evidences against it. I have the results of experiments made by digesting the pyrites with an oxydising agent, washing the residue free from impurities, weighing the gold, and comparing the result with that got from a portion of the same sample made by the ordinary fire assay, and finding that they agreed. If sulphide of gold has existed in the metoeric waters, we might expect in some cases to find it; but, as before noticed, it is so easily decomposed that it is not possible for much to have resisted the heat caused by the basaltic eruptions. I have experiments now in progress which contain the sulphides of iron and gold in solution, but up to the present time without any result in this direction. Like some of the others I have spoken of, they may require a year or more to accomplish the end wished for. Prof. Bischoff suggests silica as a medium for the transmission of gold to the quartz reefs. Gold, as he points out, certainly has a great affinity for silica, always being found in connection with it in mineral veins in the drifts, and even in the pyrites, where I have always found silica as grains and minute nearly perfect hexagonal crystals, the occurrence of which I have always been at a loss to account for. The Professor's experiment is a very instructive one. He reports it as follows: 'On adding to a solution of chloride of gold a solution of silicate of potassa, the yellow color of the former disappears. After half-an-hour the fluid turns blue, and in time a gelatinous dark blue precipitate appears, which adheres firmly to the vessel. After the lapse of some days moss-like forms are to be seen on the surface of the precipitate like an efflorescence. On exposure to sunlight no reduction takes place, but after a lapse of some months, if the precipitate is allowed to remain undisturbed under water, a decomposition takes place, and in the silicate of gold appear minute partly miscroscopical specks of gold.' If this is the method by which the gold reached the quartz lodes, as this professor argues, the origin of the silver is also that of the gold. The origin of the former we believe to be the silicates of the rocks, by the decomposition of which the silica is conducted to the lode cracks. In these silicates we have, therefore, to look for the gold, and it is possible that it is contained in them as silicate. To prove this is almost impossible, even if we found the gold; for it must, if present at all, be in a quantity too small to determine whether in combination or not. Silicate of gold is extremely insuloble in water; but if we assume that its solubility is in the same ratio to the solubility of silica as the gold of even our richest quartz reefs is to the silica in the reef, we will find no difficulty in believing this theory is possible. In several instances an amathestine color has been observed in both quartz reefs and the wash dirt of the drift. Mr. Aplin tells me that he observed in a lead near Beechworth this color in the wash-dirt. In the mine no gold was to be seen in it, but on briging it to the surface and exposing it to the air the color disappeared, and the dirt was found to be full of very fine gold, which looks very much as if there had been a compound of gold with some other substance. Ulrich some years ago was told by Mr. Clement, a successful quartz-miner, that in the centre of the German Reef, Maldon, some 70 feet from the surface, where the quartz was 10 feet thick, he observed dark blue clayey bands, portions of which, on being brought to the surface and exposed, lost all color, and were found to be full of very find gold. Be this as it may, there can be no doubt that nearly all the native sulphides contain gold, especially those which also contain silver. I have found it accompanied with this metal in every sample of iron, copper, and arsenical pyrites, galena, sulphide of antimony, and zinc blende, which I have examined from the rocks of this colony; and Dr. Percy proved its existence in every sample of galena he examined, even though they contained little or no silver. Bischoff, in reviewing facts like these, says that it has been repeatedly proved that in the decomposition of ore lodes the silver takes part in the oxidation processes, and is removed in soluble combinations. If such ores are auriferous, and after such decomposition the lodes undergo mechanical destruction, the gold will, as it is in a minute state, be carried off with the results of the decomposition. The argentiferous character of native gold, and the auriferous character of native silver, show that, although one metal passed into a suloble form and the other remained metallic, the separation was not complete. In this very minute state gold may possess properties differing from those which it has when in mass. Iron, for instance, when reduced by hydrogen form the oxide, has such a great affinity for oxygen that if dropped through the air at the ordinary temperature it takes fire, whilst ordinary iron filings, under similar circumstances, are not affected. It is, therefore, possible that gold under certain circumstances, may, by the presence of silica in solution, become disposed to combine with oxygen, and then to form with the silica a silicate of gold. If further experiments prove that alkaline silicates favor the solubility of silicate of gold, the silica theory will be open to but few objections, and the difficulties to impede our progress in solving this most interesting problem in chemical geology will be greatly diminished."—*London Mining Journal.*

Quicksilver.

In Tuscany there are four mines of quicksilver, but at the present time three have been abandoned on account of the low price obtained for this metal. The only mine now worked is that of Siele, near Castelazara. The quantity of ore extracted in 1864 was 3,000 quintals (300 tons), which yielded from 2 to 2½ per cent. of quicksilver—about 6,000 kils. Quicksilver is also found in the neighborhood of Agordo, in the Venetian provinces. The veins of sulphide of mercury are said to be most extensive, but are worked on a very small scale. The following is the annual produce of quicksilver in Italy:—

MINES.	QUINTALS.	VALUE.
Castelazara	3·000	8,6·0 francs.
Agordo	44,608	53,000 "
SMELTING WORKS.		
Castelazara	66	34,200 "
Agordo	230	91,840 "

From 1863 to 1865 the imports of quicksilver were 10,900 kils., of the value of 17,000 fr.; and the exports 1,000 kils., of the value of 2,700 fr.

Practical Letters.

[WRITTEN FOR THE AMERICAN JOURNAL OF MINING.]

ON THE VENTILATION OF COAL MINES.—NO. VIII.

BY J. W. HARDEN, M. E.

GUIBAL'S VENTILATOR.

Twenty years ago, in the construction of fans in England the practice appears to have been to allow as free a discharge over the circumference as could be obtained; but experiments by those more experienced in its use, have shown this to be wrong. In the exposure of the periphery of the fan, there was serious opposition to a free discharge of the air lifted from the mine, in the contrary action of the winds. It was, too, known in more places than one, that a very marked reduction of the ventilating current was the consequence of the wind being in the direction in which the fan discharged. Under those circumstances the diminution was sometimes as much as one-third of the quantity obtained in a calm atmosphere.

Nor was this the only form of opposition. In all states of the atmosphere, by means of steam, or dust, floating, currents might be seen entering the fan when at work. It was to prevent these disturbances that some of the fans in England were closely encased, an outlet in the shape of a chimney being left for the discharge. M. GUIBAL, in Belgium, did the same, he adding, however, a shutter, wherewith to regulate the angle at which the exhaust air is cut from the fan on entering the chimney by which it is finally carried off. For these additions he took out a patent, and called the machine "Guibal's Ventilator." Maintaining that the covering in of the fan alone would check the free discharge of the air, and would communicate to it a high velocity, he claims the shutter and peculiar form of chimney, as essentially necessary to the perfect action of the fan in ventilation.

Guibal's Ventilator, then, is an exhausting fan, and consists of eight vanes, each of which is made of oak, one and one-fourth inches thick, secured by bolts to a pair of bars and angle iron, which are bolted to two octagonal cast-iron bosses, keyed on the main shaft. These bars are carried past the boss and interlaced, and form a very firm structure, admitting of a speed of 150 or 200 revolutions a minute, without danger.

One of these fans, erected at Elswick, near Newcastle, has a diameter of the vanes of 23 feet; their width is 6 feet 6 inches, and each vane extends 8 feet into the interior of the fan, being inclined at an angle of 68° to a radial line through the axis of the boss. It is driven by a vertical direct-acting engine attached to the main shaft. The cylinder is 23½ inches in diameter, and 19¾ inches stroke.

A wall is built on each side of the fan, with an inch clearance between it and the sides of the vanes. Outside one wall the engine is fixed; and in the other an aperture ten feet in diameter is left with which the up-cast shaft connects. An arch is carried over the fan, leaving two inches clearance for the vanes, and in continuation of this arch, an invert, to a point one-eighth of the circumference below the center line, at which point the two-inch clearance is gradually increased, expanding the lower curve of the casing, till it ends in the sloping side of a chimney formed between a continuation of the pillars or side-walls of the erection. A sliding shutter is fitted into cast-iron grooved rails for about one-fifth of the circumference, which enables the concentric circle of the top arch to be completed nearly round the fan. The shutter is worked by a chain passing over sheaves at the top of the chimney and to the outside. The fan being set in motion, the air is drawn through the inlet from the mine, and discharged below the shutter into the chimney, from the top of which it is seen to issue. By means of the shutter the aperture through which the air is discharged may be so regulated as to suit particular requirements, and so produce the greatest economical effect. If the outlet be too large, air will be drawn back into the fan, as is the case with open running fans. So also if the shutter be imperfectly adjusted. Experiments have shown at what position of the shutter the best effect is obtained.

The chimney, shaped to suit its especial purpose, and the sectional area increasing upwards, enables the air discharged under the shutter at a high velocity, to expand, and, spending its force in the chimney, to pass out at a low velocity, thus benefitting the ventilating power by the difference.

With an up cast shaft of 91.40 feet in area, the consumption of coal in the daily working of the Elswick fan was 2 tons 16 cwt. in 24 hours, producing, with a steam pressure of 35 pounds, and forty revolutions per minute, 40,000 cubic feet of air per minute, at a water pressure of 0.70 inch; the effect per pound of coal being 9,184 feet of air per minute.

The cost of the fan and engine in Belgium was, in round numbers, $2,000. The cost of erecting and of the building was $1.200 in addition thereto.

With 57¼ revolutions per minute, 60,441 feet of air per minute was obtained with a water pressure of 1.4 inches; giving a useful effect of 52 40 per cent. of the power applied.

In my correspondence with the North of England, two years ago, I was told that my friend had just erected one of M. GUIBAL'S fans, and that he was much pleased with it. With an up cast 87 feet in area and 342 feet in depth, with two furnaces, he obtained from two seams of coal 35,240 cubic feet of air per minute, which was not enough, an extension of the works necessitating more. From the depth of the shaft the ventilating column was so short that it was deemed a suitable case for a Guibal fan, and one was erected, a contract having been made with the inventor. The fan is 30 feet in diameter and 10 feet in breadth. With a uniform motion of 64 revolutions a minute, 98,488 cubic feet of air per minute was obtained, with a water guage pressure of 2.5 inches. And with water guages varying from 2.5 to 3 inches, from 91,000 to 106,000 cubic feet of air per minute was obtained. The fan, now regularly at work is ventilating the two seams with 65,955 feet of air between them, and my friend says, "For shallow pits, under such conditions as our Pelton colliery labors, M. GUIBAL'S fan will be found the most effectual." I ought to have said that an up-cast ten feet in diameter has been put into the second seam, the two columns coming together before reaching the fan.

Mining Summary.

GOLD AND SILVER.

Montana.

HELENA, Montana, August 10, 1868.

NOTES ON SOME PROMINENT MINES—POOR MAN'S JOY AND OTHERS.

EDITOR AMERICAN JOURNAL OF MINING:

Having a few leisure moments I avail myself of them to give you some items jotted down while on a flying visit over the mountains recently. I left Helena on horseback, on Thursday, July 28th, and after five hours' ride, arrived at Clifton early in the afternoon. At that place a new and flourishing mining camp was being started. Among the pioneers I found Foster and Sears, who, for two years, have been working to develop some silver ledges. They came to Clifton in 1865; since that time there has been uncovered and exposed in the Douglas lode, a crevice sixteen feet wide, with an open working 160 feet long, ranging in depth from twelve to twenty feet. They have also done an equal amount of work on the Ivanhoe lode, but their efforts have been chiefly confined to the development of the Roderick Dhu, which is a silver bearing vein, having an average width of thirty-two feet, with an incline run in over one hundred feet. They have also run a tunnel, and have, moreover, three separate workings, with tramways, cars, etc., necessary for taking out ore conveniently. They are mainly at work now preparing their yard for ores, of which they have out several hundred tons. The surface ground of the veins is worked by the hydraulic method of mining, and pays, on an average, from an ounce upward, per day, to the hand.

The St. John's company have a mill that is nearly ready for operations on ore from the Allen lode, which yields gold-bearing quartz. The camp bids fair to equal any in the country. It is situated in the centre of placer mines, as well as on one of the richest mineral belts yet opened in the country. From Clifton I proceeded to Balson Creek, five miles distant. I found there some eighty or one hundred persons engaged in placer mining. The gulch was discovered this season, and already has saloons, stores, hotels, etc., and bids fair to become a flourishing mining camp. From this point I started down the Big Boulder, and from time to time saw men working and prospecting for quartz. Boulder has been prospected and worked for the last three years for placer and quartz mines, and, with capital, would add materially to the gold-producing reputation of the Territory. Continuing my journey I arrived at Silver Star district, and found everything quiet. The mill of Bates & Truitt was crushing quartz from the Iron Rod lode, which, from the surface to its present depth of 140 feet, has paid handsomely. In fact, it has caused a town to spring into existence almost as if by magic, which boasts of such stores, etc., as are usually to be found in all thriving mining camps. There were four arastras at work grinding quartz, and everything looked very promising.

Rochester, distant fourteen miles, was in no way behind the districts of its neighborhood in mills, and gave every evidence of prosperity. On Wednesday I arrived safely at Helena, after having passed through and examined the Park mill and lode, a short distance above that place. The mill was being thoroughly refitted. It promises to be one of the best in the Territory when the improvements are completed. The lode was being opened to a much greater depth than ever before, showing quartz of the very best quality. In a few days the stamps will again be heard, and the result will no doubt be very flattering.

In closing my notes I cannot forbear recording some of my observations while travelling in the famous Flint Creek Mining District. Among its most noted lodes I would particularly call attention to the Poor Man's Joy. Claims originally sold on this lode for $100, now it would be difficult to make terms. Among the early purchasers was Cole Saunders, of Helena, now one of the successful merchants of Montana. Mr. Saunders represents, by power of Attorney, the balance of the available portion of the lode not owned by himself. Numerous assays of ores from this lode, by Bohm and Molitor, and Prof. Rumley, of Helena, have given yields from $800 to $1,000 per ton. Such results were deemed incredible for belief. People generally supposed they were made from very small pieces of rock, in fact, what we call "specimens." The owners, however, have been persistently developing their property. If they had continued to *talk* of this mine, instead of *working it*, they would have still been regarded as lunatics. I am glad to say that success has crowned their efforts, and to-day the Poor Man's Joy stands as the banner mine of Montana. The vein has been stripped a distance of 150 feet along discovery, and shows an average width of six feet. Both walls are well-defined. It has, moreover, been traced several places on each side of discovery—on the south as far as No. 4. It has the appearance of permanence as far as all indications show. Five hundred tons of rich rock ore on the dump-pile, and from 1,500 to 2,000 tons are exposed to view, ready to be blasted out when needed. I see nothing to prevent the vein still continuing, and a corps of men are constantly working it. The ore is very rich, but contains arsenic, antimony, and copper in small quantities. This necessitates the employment of amalgamating machinery of the most approved kind. Mr. Saunders has selected twenty tons of the richest ore, and has had it packed in rawhide-sacks and shipped it for New York. It will be divided, on arrival there, and shipped to Swansea, Belgium, and to the works of Secor Swan & Co., New York, for metallurgical treatment. It will therefore have the opportunity of being tested in Wales, Prussia, and America. Such tests as these should establish the value of the mine. The most practical mining men among us estimate that this shipment of twenty tons of select ore will yield $1,000 per ton in fine silver. It is estimated that the whole cost of mining, transportation and smelting will be less than $150 per ton, currency. We await the result of this shipment, which will, we trust, be followed by that of thousands of tons of rich ore, now useless for the want of proper machinery to work it.

A commendable amount of energy and enterprise has been displayed in making this shipment, and the owners will, no doubt, realize largely from the venture. There are a number of rich veins in the Flint Creek district, and, as they are opened up, many of them will, no doubt, reward their owners munificently. More anon. SPECTATOR.

Apropos to the above we give place to the following correspondence, which we find in the *Montana Post*, concerning another of the rich mines in the Territory, the Park mine, of which Mr. James W. Whitlatch, the autocrat of Montana miners, is the principal owner. Says the correspondent: "The Park is located some four miles southerly from Helena, and about one mile from Unionville. It was discovered by Henry Wareham, in November, 1864, and by him conveyed to Mr. Whitlatch in September, 1865. Edward E. Walker, Esq., subsequently purchased a one-third interest in the mine from Mr. W., and is now associated with the latter in developing it. Mr. Walker is a miner of long experience, and is, in every respect, an honest, reliable man and gentleman. He is now East for the purpose of procuring a first-class mill with which to commence work upon the mine. There are now about 500 tons of ore out and ready for crushing as soon as the mill arrives. This lode, the first purchased by Mr. Whitlatch in the Territory, is thought by its owner to rival the famous Union lead in richness, and he even expects richer returns from it than from the latter, the most celebrated mine in Montana. For the purpose of showing that there are others to be found who also place a high valuation upon the Park mine, we may mention that Mr. W. was recently offered $50,000 for his two-third interest in it, but refused to dispose of it for a less sum than $100,000 in cash. The Park lode, which is now being energetically worked, is, at present, provided with two tunnels, one two hundred and the other one hundred and thirty feet in length, and five feet wide by six in height. A new incline has also been constructed, at the end of which the ledge—six feet in width, shows an abundance of beautiful ore plentifully sprinkled with fine gold."

Nevada.

QUARTERLY RETURNS OF BULLION PRODUCING MINES IN NYE COUNTY.

We find in the Mountain *Champion* of Aug. 19, the returns of bullion produced in Nye County, during the quarter ending June 30, as shown by the official report of the County Assessor. In the District of Twin River the Murphy mine of the Twin River Company produced 838 tons, which yielded an average of $154 89 per ton. In the district of Philadelphia (commonly called Silver Bend), the Highbridge mine of the Combination Company produced 450 tons, which yielded by dry crushing an average of $107 08 per ton, and 688 tons which were crushed wet, yielding an average of $33 03 per ton; and the El Dorado South produced 123 tons, which yielded an average of 183 59 per ton; and four tons which yielded an average of $554 71 per ton. The Liberty mine in the District of San Antonio produced 114 tons, which yielded an average of $139 29 per ton. Ore was worked during the quarter from 11 different districts, in which it was produced by 34 mines. Union District contained the greatest number of mines which produced bullion, amounting to 14; and the District of Philadelphia contained 10 mines which produced bullion. The total number of tons reduced, during the quarter, amount to 2,460, which yielded the sum of $276,159 93 in currency, being an average of $112 26 per ton.—*Reveille.*

Humboldt.—The *Register* of Aug. 8 says of the Montezuma Smelting Works: This institution has passed into new hands. Until lately it has been run by the Trinity and Sacramento Silver Mining Company. The latter company was a New York City corporation, originally formed for the working of the Chrysopolis mine in the East Range. Mr. Nason was sent out as the Superintendent. He prospected the Chrysopolis a little, and found that although a very promising mine, it required considerable labor and time to properly develop it, and his company, being from a fast city, was anxious for immediate return. He, therefore, looked about him, and concluded the Montezuma mine in Trinity District, was the best thing in sight that he could get hold of. His company, however, only secured a bare majority interest, 1,005 feet out of 2,000. The remaining 995 were purchased by some capitalists from Western New York and Ohio. These parties bought from Rollins and Brown, and gave a mortgage, and it was about that mortgage and that particular interest alone that there was so much contention and litigation in our District Court last year. The conflict between these two interests has interfered greatly with the complete development of this enterprise. From what we can learn, the trouble was that the New York City wanted the Western owners to come into their corporation, but the latter refused to give up control of their interest. Finally, the Western men incorporated their interests under the name of the Montezuma Mining Company, with their office at Rochester, Western New York. This brought the matter down to close quarters. It was now corporation against corporation, with a difference of only ten feet, out of 2,000 between them. The Trinity Company had the odd 10 feet, but the Western Company outflanked them in some way, and on the 3d instant the company hauled down its flag, disbanded its organization, and the Montezuma Company now camps on the ground, owner of the whole mine, 995 feet in its own right: the remaining 1,005 feet by purchase of all the right, title and interest of the Trinity Company therein, as well as to all other property in this county formerly owned by it. The city of Rochester is complimenting this county in a very marked manner in the way of investments. This is the third company organized there for the working of Humboldt mines. We welcome their new venture, the Montezuma Mining Company, and are happy to feel that they have a mine which will insure them success. They have shown excellent judgment in purchasing in the Montezuma in the first place, in getting absolute control of it in the next, but not the least signal instance of their good sense is the retaining of Mr. Nason as their permanent manager. With great care and labor he has, during the last three years, laid the foundation for a great success for this mine, and it is but just he should enjoy the direction of this new company now starting with such brilliant auspices. All the transfers have been made, and the new company is fairly at work. The furnaces are all aglow and never did better work than now. Large sales of lead have recently been made to parties in San Francisco, and the entire product of the works for the next three months have been contracted for. Selby, the big metallurgist at San Francisco, has an agent at Oreana, who takes the metal as fast as it cools, and hurries it on by rail to the refining works at the Bay. Three hundred tons will be shipped by the first cars from Oreana, which will leave in about two weeks. The purchase of the whole property by the Montezuma Company; the favorable arrangements made with Selby; the completion of the railroad to the works, and the retention of Mr. Nason as manager, form a combination of events in the interest of this company on which we sincerely congratulate the fortunate stockholders.

Idaho.

In continuation of a review of the mines of Owyhee and adjacent mining districts, the *Avalanche* proceeds to speak of the Iowa and Idaho Mining company. It says: This company, under the management of Uriah Perry, Esq., have resumed operations in Flint. On the Forest ledge a shaft, already down 120 feet, will be sunk 30 feet deeper, then stoping and drifting will commence, and large quantities of ore be taken out. We understand the mill will be thoroughly overhauled, the Dodge Crusher taken out and stamps put in its place.....The Cosmos mill has again started up, and is now running on Silver Cord ore with good paying prospects. At present there is quite a large pile of rich gold-bearing quartz on the dump. Prescott, one of the best miners in camp, has charge of the mine. From present appearances, the Cosmos company will make a success of it this time. The mill has a working capacity of ten stamps and six pans, and works splendidly.....Fred Reuter has commenced work on the Star of the West ledge, and is making preparations for sinking a shaft thereon some fifty or sixty feet west of the Minnesota. The vein on the surface shows a width of eighteen inches of gold and silver-bearing quartz. Some large pieces of the ore which we saw had fine gold and black sulphurets of silver all through it.....Work has been resumed on the Surplus Oro Fino. The small steam engine recently used at the Ida Elmore is now employed on the Surplus.....The Miner mill has commenced running on ore from the Glenbrook mine..... Dan Powers and partner have been for some time engaged in overhauling the refuse materials at the Golden Chariot dump. With a set of sluices and a small head of water, they have managed to make eleven or twelve hundred dollars, besides saving 9½ tons of ore which has been worked in the Webfoot mill; yielding the snug little sum of $2,438. Making an estimation on the whole time engaged in the work, it is found that $10 per day, clear profit, was made to each man—more than average placer diggings. Yet, there are quite a number of refuse dump piles among our mines that would pay, if not as largely, at least good wages. In fact, there is doubtless good pay all along the roads over which quartz has been hauled for two or three years; because a certain quantity of mineral will always sift through wagon beds and be lost on the way to the mills.....Giant powder will doubtless soon be generally employed for blasting purposes in our mines. It is used here by the Woodstock company almost to the entire exclusion of common powder. The Golden Chariot company have also adopted it, and would not now do without it, especially for sinking shafts, and in places where water is troublesome.

New Mexico.

THE GOLD MINES OF SAN LAZERO.—ANCIENT RELICS AND TRADITIONS.—THE NEW MEXICAN MINING COMPANY.

EDITOR AMERICAN JOURNAL OF MINING:

It has been my fortune to spend a few days at the Placer Mines, twenty-seven miles south of Santa Fé, N. M. Though much has been said of the buried wealth of this locality, yet, after several days' careful examination, I am satisfied much more might be said, and still not convey to the casual reader an adequate idea of this wonderful deposit of the precious and the baser metals.

On inquiry from the superintendent of the only mill now in operation there, (Dr. M. Steck,) I was informed that the mountain known now as the Placer mountains was, at an early history of New Mexico, called la Sierra de San Lazero.

Fabulous tales still exist among the older inhabitants of the great wealth of the gold mines of San Lazero. These tales have now assumed the form of tradition, and as the mountain has changed its name within the last fifty years, the hidden treasure and buried mines of San Lazero could not be located.

I am informed that an old manuscript is in the hands of Lewis Gold, (one of the enterprising merchants of Santa Fé,) dated early in the seventeenth century, gives a description of a wonderfully rich gold mine in the mountain of San Lazero. If interested parties will examine the archives of the Territory, they will find that the mountain of San Lazero, of the seventeenth century, is the Placer mountain of to-day.

The written evidence, referred to, proves that the gold deposit of the new and old placers is not, as is generally supposed, a recent discovery; but that it was known and worked by the energetic Spanish conquerors as early as the sixteenth century; and, very probably, by the Aztec race, or Pueblo Indians, before the conquest.

It is a fact (established beyond controversy by Costenada, Prescott and others) that Quinera, a deserted town about seventy miles south of the Placers, was, at the time of the conquest, the greatest gold producing province subject to the great Montezuma; and that her merchants and jewelers made yearly visits to the city of Mexico to sell their golden handiwork, or exchange it for the fine feather-work of the great monarch's more southern subjects. As there are now no gold mines known nearer the Grand Quinera than the old and new Placers, it is very probable their principal of gold supply came from this locality.

This supposition is strengthened by the fact that there are still visible the ruins of several large towns at the base of the Placer mountains, on the property owned by the New Mexico Mining Co. The inhabitants could not have been agricultural people, as there is no permanent water within several miles. The reasonable conclusion is, therefore, that they were miners, and that the great Montezuma received a portion of the fabulous wealth he is said by Prescott to have possessed, in gold ornaments, from the mines now owned and worked by the company first named.

This supposition is further strengthened by the fact that history and tradition fix the birth-place of this great Indian monarch within thirty miles of the Placer; and that the Pueblo Indians of this country still acknowledge that their fathers were his faithful subjects.

The recent discovery of gold at the old Placer, or Real del Dolores, was made under the auspices of the Delgado family, in 1832. The Placer mines were found to be very rich, and the second year after the discovery (I am informed by people still living here who witnessed it) there were three thousand people engaged in gold washing and trading with miners.

This prosperity continued until 1848, when General Carney made his appearance on the borders with American troops. It is stated, on good authority, that over a quarter of a million dollars were taken out each year for at least twelve years.

The Mexican war opened new channels for capital, and so advanced the price of labor and provisions, that mining became less profitable, yet it is known that the gold taken out from 1833 to 1846, at the Placers, formed the basis or commencement of the large fortunes in the Territory.

In 1853 the New Mexican Mining Company purchased the celebrated Ortiz mine and grant, with an area of one hundred square miles. This covers most of the gulch mines of the old Placer, and the entire mountain of San Lazero, effectually preventing individual enterprise, while the company has done but little to develop the immense wealth that lies buried within their limits.

So large a grant is a serious detriment to the development of any community, but especially a mining district. I feel satisfied that individual enterprise would now have a dozen mills in operation in and around the Placer and Tuerto mountains, but for the grants that cover them. I hope, therefore, for the interest of New Mexico, and for the development of her resources, to hear that the New Mexican Mining company will soon extend their search beyond the Ortiz vein, which is only one of more than fifty outcropping quartz lodes on their property, apparently as rich as the ore they are now working successfully. VERITAS.

Arizona.

The Prescott *Miner*, July 25, has the following items of mining news: "A condition sale of the Sterling mine has been made to parties who will go to work on it inside of fifty days. The sum to be paid is, we are informed, $30,000. The gentleman who made the purchase intends to work the rock by the chlorination process.....Work upon the Chase lode is being pushed forward vigorously. Another tunnel has been started. The water comes in fast in the old tunnel, and some spots have to be timbered. The ledge is looking well in both tunnels, but is largest in the new.....Owing to the wet, damp weather, which, no doubt, makes the air bad in the Chloride shaft, work upon the Chloride is, for the present, not being carried on.....N. P. Pierce, N. L. Griffin, and Milton Hadley went over to the Agua Frio District last week to take a look at their mining property, locate ranches and a water privilege, all of which they accomplished. It is their intention to run arastras soon.....Messrs. Groom, Cole and Little have gone to the Sterling mill. They will sink a shaft on the Platanka silver lode.....Mr. J. D. Monfaon reports that at Walker's, on Lynx creek, he found the miners busily engaged taking out ore and arastraing it. At Charley Taylor's camp on the Hassayampa, he found everything all right; wheel and arastras nearly completed, and a very rich ledge opened.. Mr. A. E. Davis, just at Prescott from Mohave City, on the Colorado River, imparted the following information: He (Mr. Davis) has sold the Mitchell mine to the Pittsburg and California Gold and Silver Mining Company, who are now erecting a mill, etc., to work the ore, at a point on the river five miles below Mohave City. The Mitchell, Mr. D. thinks, will average thirty dollars to

the ton. Mr. Hardy and others were operating upon other mines. Letters had been received from Gen. Palmer, in which he spoke encouragingly of railroad matters. The weather was warm at the river.

Utah.

It may seem strange to many, but it is nevertheless a fact, that the Mormon leaders are not only bitterly opposed to the prosecution of mining within the limits of their own settlements, but they moreover lose no opportunity to circulate discouraging accounts of the mining localities adjacent to them. We hear from a trustworthy source, however, that the mines in the vicinity of Stockton are yielding handsomely. The following is an extract from a private letter from that place, dated August 14, which we are enabled to print through the kindness of a gentleman in this city, who wrote to enquire about the latest results in that seldom-heard-from locality. Says the letter: "You ask me if any bullion has actually been run out. I can say that Finnerty and others run out 10,000 lbs. of lead, and sold it in Salt Lake City without separating the silver from it. Finnerty says the silver in the lead was at the rate of $85 to the ton. His furnace burnt out in two weeks, being constructed principally of adobe. It is of no use to build furnaces unless we have fire brick to use in their construction. In Bingham Cañon the miners are washing out much gold. One company of five took out in one week $1,100 worth of dust, and another week $700 worth. Weberling is over there assaying copper to see how much gold there is in it."

Maine.

A correspondent of the Bangor *Whig* writes that silver ore has recently been discovered upon the farm of Reuben Curtis, in the town of Penobscot, Hancock county. Attention was first directed to it by the surface rocks, which exhibited indications of volcanic origin; and upon inspection by a practical geologist of Boston, was pronounced to be a fine specimen of gold quartz, identical with that of the Rocky Mountains, and predicted that gold would be found 10 or 15 feet below the surface. The farm has been leased for a term of years to Sebin Hutchins, Dr. W. C. Collins, and Joseph D. Leach, and exploration commenced. An excavation of five feet in depth reveals the silver ore in abundance.

Alaska.

The Montana *Post* says: "Tom Fairweather, well known to many old miners of the Territory, has just returned from an extensive prospecting trip in Aliaska. He prospected through the British Possessions until he struck a tributary of McKenzie river, where he worked placer diggings, but realized only four dollars and a half per day to the hand. What Indians he came in contact with were friendly. The climate is mild, and the winters are not as severe as in Montana. His fifteen months experience in the northern country induces him to return there next spring.

COPPER.

Vermont.

THE COPPER INDUSTRY OF ORANGE COUNTY.

We were favored, a few weeks since, with an opportunity to examine somewhat minutely into the industrial and economical condition of the copper interest of Eastern Vermont. Public attention has been so much attracted to the "rise and fall" of magnificent mining enterprises in the Western States and Territories, that many of the more modest, and, mayhap, all the more substantial undertakings in the East, have been allowed, for the most part, to spring up and pass on, many of them to a state of successful development, without a word of comment on the part of the public press. As it is a part of our business to chronicle the condition of mining interests throughout the whole country, in so far as we can obtain trustworthy information thereupon, a few notes of our own upon the copper industry of Orange County, Vermont, put into readable shape, will prove not only an act of justice to the cause whose interests we serve, but also—may we not reasonably expect it?—acceptable to the general reader.

GEOLOGICAL FEATURES.

Along the eastern part of the State of Vermont, through Northern New Hampshire, and on into the Canadian Provinces, extends a belt of rocks whose high degree of metamorphism has so nearly obliterated all traces of former animal or vegetable life as to leave it a matter of doubt in the minds of some of our ablest geologists whether it belongs to the Devonian or the Silurian period. Nor, indeed, aside from traces of extinct fauena and flora, has it been possible for any of the rules touching the conformability or non-conformability of geological formations to settle this very difficult question. The rock consists of a calcareous mica slate, calcite interfoliated in the schist being often found; and, too, nodules or bands of white vitreous quartz are often seen. The trend of this system of rocks, as determined by geological surveys, is N. 31 degrees E., while the dip ranges in the neighborhood, say, of 25 degrees to the Southeast.

COPPER ORE DEPOSIT.

Some fifteen years ago, or more, a deposit of copper ore was discovered in this zone of mica slate, in the above-mentioned locality. It is of vein-form, and cuts through the very much contorted, schistose rock with an average strike of N. 7 degrees E., differing, it is seen, but little from the general course of the country rock. There is a similar tendency to coincidence in the direction of the dip of the vein and that of the strata of the mica slate, the former being 9 degrees to the Southeast, while, as just observed, the latter is 25 degrees. The vein, in its general character, is more or less irregular. It varies in width from four to eighteen feet, the average being about nine feet. Spurs, splits, and "horses," all characteristic of true fissure deposits, are numerous. No one well versed in such matters can examine the deposit without being thoroughly convinced that, as regards the depth to which the vein can be worked, the limit will be a *practical*, not an *actual* one. Nor, indeed, during the lives of several generations to come, will there be any likelihood of an exhaustion of the supply of copper ores that may be obtained within the present practical limits of raising ores from vein deposits.

THE VEIN MINERALS.

To speak now of the mineral mass of which the vein is composed, we may remark that it consists, in greater part, of an intimate mixture of copper pyrites, magnetic iron pyrites, zinc blende, and quartz. There are no selvages to the vein. The mineral mass is, therefore, often found interfoliated with the wall rock. A good deal of mica slate is also found mixed in with the vein mass. The numerous "horses" that occur are composed of the same mineral. As determined by careful assays, the amount of copper contained in the ore, after it has passed through the dressing works, ranges from eight to ten per cent. The vein has been traced a distance of some ten or twelve miles. Along the line of it a series of alternate valleys and ridges present the most favorable conditions, as regards the work of development, nor, indeed, have they been lost sight of in the operations that have been, and are now being carried on.

MINING PROPERTIES—THE VERSHIRE.

Among the more important mining properties to which this copper ore deposit has given rise, are those owned by the Vershire, Corinth, and Union Companies. These companies are organized under the laws of the State of Vermont, with a capital stock of $500,000 each. The property of the Vershire Company is located at the southern extremity of the vein as discovered. A very high ridge, through which the vein cuts at this point, has given an admirable opportunity for developing the property by means of a shaft sunk along the dip, and connecting with this, a series of adit levels run along the course of the vein. This vein has already been worked down a distance of 800 feet. The method of development insures perfect ventilation, drainage, and a cheap and easy means of removing the ores from the mine. The company has been in existence some fourteen years, or more, during which time, with little or no intermission, they have been at work developing their property. They are now in condition to take some four hundred tons of ore monthly from the interior workings of the mine. Their ores, until of late, have been sold, at the highest price obtainable, to the copper smelting works near Boston, New York, or Baltimore. The company has paid occasional dividends from the net proceeds of the mine, and may be considered, at the present time, in a very prosperous condition.

THE CORINTH PROPERTY.

This is situated some eight or ten miles northerly from that of the Vershire. Of the development of it—which began some five years ago—we came in possession of a few facts only, but enough withal. Although very favorably situated for opening up, bad management compelled assessment after assessment, with no adequate return therefor. Work upon the mine is now suspended. As an instance of the carelessness which characterized the engineering department in the performance of its labors, we were shown the spot where it is said an attempt was made to run an adit level 500 feet long, with the intent to strike the bottom of a shaft some 400 feet deep. The result was the tapping of the shaft, not at the bottom, but at a point seventy-five feet above! That was a feat in mining engineering, in point of ignorance, carelessness, or both, not easily beaten, we take it. No wonder the company saw fit to stop work. No wonder they found that assessments instead of dividends were the order of the day.

THE UNION MINE.

This property adjoins that of the Corinth Company, and is situated upon the same slope. Although a little above the summit of the ridge, the opportunites for extensive development are all that could be reasonably desired. The company are in possession of some seventy acres of land through which the vein cuts. This gives them the ownership of about two thousand feet along the course of the vein. About three years ago this company began to develop their property. The circumstances of the time were apparently very favorable for the inauguration of such an enterprise. Labor, in that region, was not very costly; while the high price of copper, that then prevailed, gave indications of speedy and profitable returns. The opening up of the mine has been conducted in an excellent manner, under the care and control of an experienced agent, and a well-trained English mining engineer. Two short adit levels, one above the other, have tapped the vein at convenient distances below the surface, and then, by means of stoping, large quantities of ore have been removed. Already there have been taken from this deposit, by a small working force of twelve or fifteen men, about 5,000 tons of ore, averaging from 8 to 10 per cent. The mineral mass is drawn from the mines by means of mules attached to a small car along the drift, the adit level, and, from thence, a short distance along a surface tramway to the dressing works, where it is broken in pieces, and sorted for market. The fine ores that gradually accumulate in the mine, and in the dressing, or, as it is termed, the cobbing house, are washed and concentrated in a somewhat rude, but nevertheless, very effectual, and, at the same time, economical manner. This fine ore is put through several processes, which, in the language of the Cornish miner, are termed "jigging," "sifting," "tying" and "stripping." Two men, by these methods, prepare some 200 tons of washed ore for the market yearly. They keep up the process of concentration until they get an ore varying in richness from seven to eight per cent. This work is done by contract, the dressers receiving sixty-five cents per unit, or in other words, sixty-five cents for every per cent. of copper contained in the concentrated ore. Since twenty odd men are employed in the "cobbing" house, breaking up the mineral mass as it comes from the mine, and sorting out the copper ore. Although there is a force of only about thirty-five men employed in and out of the mine, yet so easily are the ores obtained and dressed, that this small party are able to prepare for market from sixteen to eighteen hundred tons per year. We are informed that, during the past three years, the company have sold, for the most part, to the Baltimore Copper Smelting Company, very nearly or quite $125,000 worth of ore. At the present time they stand free of all indebtedness, have several hundred tons of merchantable ore on hand, and a fine lot of reserves in sight. While working out these reserves, it is proposed by the engineer in charge to run another adit six hundred and sixty-five feet long, so as to strike the vein a perpendicular distance of one hundred feet below the point where it is struck by the lower of the two existing adit levels. This will give a distance of one hundred and thirty five feet along the dip of the vein. The projected adit can be driven at a cost of about $17 per running foot. At that rate, the projected adit would cost some $12,000. It is, however, only when we mention the fact that 5,000 tons, or thereabouts, of ore, worth in market some $125,000, have been taken from an area on the vein comprised in a length of only 130 feet, height of 120 feet, and width of 9 feet, that the great value of the reserves that will be opened up by the projected adit can be really appreciated. When it is, moreover, remembered that the company own some two thousand feet along the strike of the vein, this great value will become still more apparent. It is still further of importance to remark here that, since the strike of the vein along the slope of the ridge is nearly parallel to the course of the valley below, there is offered, should it ever be deemed advisable, an opportunity to open up this vein-property along its entire length by means of a series of adit levels, located one after another along the hill-side. By this means the amount of ore that could be taken out in any given time would be limited only by the number of men that could work along a distance of some two thousand feet. It would be enormous. This property alone would, under such circumstances, furnish regularly copper ore enough to keep an ordinary smelting works running for a long series of years. But, again, there is opportunity for adit levels to strike the vein at still lower points, when, in the future working of the mine, it shall have become advisable. It is, also, well worthy of note that this system of development by means of adit levels is very much favored by the dip of the vein. This dip of some 25 degrees falls on the same side of the perpendicular with the line of greatest slope of the hill-side along which it cuts. The vein is, therefore, at successive depths, carried further from the perpendicular, and, of course, proportionately nearer to the surface of the declivity that terminates in the valley below. But that there is, under such favorable circumstances, an almost unlimited opportunity for future development, no one who visits the spot can entertain a reasonable doubt. The market facilities, though not the best, are yet, to a certain extent, favorable. The ores are hauled from the mine to the town of Bradford, Orange County, Vermont, on the line of the Passumpsic Railroad, a distance of twelve or thirteen miles, at at expense, in winter, of two and a half, and in summer, of three dollars per ton. The ores going to Baltimore are transported from Bradford to Portsmouth, N. H., or New Haven, Conn., by rail, at a cost of some four dollars per ton; thence by water carriage to their place of destination. They are usually sold at so much per unit—the rate, of course, depending very much on the market price of metallic copper—to be delivered at Portsmouth or New Haven. It may be well to remark that there are two elements of loss entering into this shipment of copper ores. The first is an appreciable loss that is brought about by leaching when the ores are exposed to the influence of atmospheric agencies. The second is an unavoidable waste by carriage, amounting to about one per cent., or one ton in a hundred transported. The loss, in the first instance, varies, of course, with the care taken to protect the ores from exposure. It is a matter of so much importance that too great attention cannot be given in order to prevent it.

METALLURGICAL WORKS.

When we consider the fact that it costs some seven dollars per ton, aside from waste, to get these Vermont ores to market, the question naturally arises, would it not pay to smelt them on the spot? If coal, suitable for smelting purposes, could be obtained in the vicinity at, say, five or six dollars per ton, there would be no doubt as regards the matter. Rules of economy would say, build a smelting work near the mine, and manufacture, if not ingot copper, at least a regulus of seventy or eighty per cent., reducing the expenses of transportation thereby to, comparatively speaking, a merely nominal amount. But another side of the question presents itself when it comes to paying eighteen or twenty dollars per ton for coal, and that would, in the present case, be necessary. The whole thing resolves itself, then, in great measure, into a question of transportation. Is it more economical to ship the ore, or put up metallurgical works, bring in fuel from the coast, smelt the ores on the spot, and then ship a copper regulus? The Vershire company have, in a spirit of commendable enterprise, undertaken to solve this problem, and that, too, at the present high rates of labor and unprecedentedly low price of ingot copper—a price that ranges considerably below the average cost of production. During the past year they have erected a smelting works, near their mine, consisting of four furnaces, with all the necessary equipments, at a cost of some eighteen or twenty thousand dollars. About the last of July, they made their first shipment of copper matt, which was sold to the Revere Copper Company of Boston, Mass. The matt is the product of one smelting operation, and contains from thirty to forty per cent. of copper. The cost of transportation from the metallurgical works to Boston is about seven dollars per ton. The fuel used is coke, brought from Nova Scotia at a cost, delivered at the works, of some $18 per ton. The ores are roasted, previous to smelting, in the open air, on large areas, in piles of about one hundred tons each. It requires about two months for one of these heaps of ore to become roasted through, so to speak, so as to be fit for smelting. The gangue of quartz, magnetic iron pyrites, and mica slate, in intimate mixture with the copper pyrites, forms in itself a natural flux. This is an element of great consideration, as thereby the cost of fluxing by artificial means, which is often quite expensive, is wholly avoided.

PEAT VS. COKE.

Nor, again, should we, at this point, fail to remark, that only a few miles from this deposit of copper ores there are large beds of peat, which promise, in the end, to furnish an almost inexhaustible supply of fuel. If it can be made to serve the purpose of smelting these ores, then the success of this, or other smelting works in this copper district, would be, as it were, insured. In case of one trial upon the Vershire works, the furnace was run some seven hours with peat alone before it was found necessary to "blow out." We were told that the peat used in the trial referred to, was quite green, and badly prepared, and, indeed, of the truth of this we were, from personal examination of some of it still on hand, well assured. It would seem, under the circumstances, to be a matter of the greatest importance, to determine whether this peat, when well prepared, cannot take the place of coke in the reduction of the ore. If it could not do that wholly, might it not, in great measure, so as to materially reduce the cost of smelting? There is a wide difference in the cost of peat at, say, five dollars per ton, and coke at eighteen dollars. But even without the utilization of the peat, it is rather our conviction, judging from the somewhat partial data we are in possession of, that a fair measure of success will attend the inauguration of this new metallurgical industry. Nor, in passing, should we forget to notice the fact, that the ores are remarkably free from elements injurious to the copper produced therefrom, such as antimony, arsenic, etc. They are so pure, that from them, under the ordinary modes of treatment, a first-class quality of copper can be obtained. We have given a somewhat lengthy account of the copper industry of Eastern Vermont; we are confident, however, that the enterprise merits all the space we have allotted to it. Nor, indeed, can any, who are directly or indirectly interested in this branch of mining and metallurgical industry, do better than to make themselves acquainted with what is going on in that locality, if they have not already done so. It is a field that promises largely for the future, and lies, as it were, in our midst. We hope to chronicle, from time to time, much that will be of interest to our readers, in regard to this promising mining section of the East.

Michigan.

Condensed from the Portage Lake *Mining Gazette* the news from the copper mines is as follows: The Central Mine stamps are at work again, and said to be doing excellent duty.....At the Cliff the working force has been considerably increased, since active stoping has recommenced.....The National Mine produced in July: Masses, 12 tons, 1,210 lbs.; barrel, 3 tons, 790 lbs.; stamp, 10 tons, 1,518 lbs.—Total, 26 tons, 1,518 lbs. It is authoritatively reported that Mr. E. J. Hulbert has disposed of that portion of the Red Jacket property lying in section 14, and cornering on the Calumet and Hecla so closely, and it is also reported that Mr. John Simpkins, of N. Y., is the purchaser of a considerable amount.....At the Allouez a party of six men have had a contract to sink a new shaft a short distance from the old one, and now they have got down some distance and found a splendid show of coarse copper.....Since the visit of M. Edward Estivant, the proprietor of the Clark mining location, he has determined, it is reported, to resume work in an active form at an early day, at the commencement of the fall season.

New Hampshire.

The copper mines at Warren, N. H., have been idle for some time past. We learn from a reliable source that operations have commenced again. A new steam engine has been put in, and a force of 75 men will be kept at work during the coming winter.

☞ The government of Chili has sent a collection of eight hundred animals to Paris, attended by two agents, who are instructed to divide them among the various zoological collections in Europe in exchange for other species. Surely this is a step in the right direction, and does credit to Chile.

☞ Important discoveries of slate have been made in Northern Minnesota. A slate ridge over 20 miles long and 6 wide has been found, and in the St. Louis river is a large island of pure, workable slate, which rises 75 feet above the surface of the river.

☞ The lead mine in Lehigh county, Pa., has been deserted as a bad investment. Instead of the lead the projectors found nothing more than plumbago, commonly called black, and that scattered through the rock in small quantities.

☞ The pearl fishery grounds recently discovered at Western Australia extends along the coast for one thousand miles. Upwards of fifty tons of pearl oysters were fished up in December last, and sold for £100 per ton.

☞ The tour of the world can be made in two months and a half, when the Pacific railroad is finished.

The Granite Quarries of Cape Ann.

Whence comes the granite that looms in the great structures and paves the broad streets of our cities? Ask the question locally and you will have local answers; perhaps the general answer would be Quincy, the two names being almost synonymous. The first railroad the Bay State boasted of was established to favor the quarries in that town. But Q is not the only letter that stands for granite; the next in the alphabet has a similar significance. Not an hour and a half's ride from the capital of the State, on the Eastern railroad, is Rockport, vigorous and growing,—sprung from the little 1812 village of "Sandy Bay" to the power and position it holds now. Swing off from the depot towards the left, taking the road to "Pigeon Cove," and in five minutes walk you are among the quarries of the town. They only commence here, for following the same course on, doubling the Cape, a matter of fourteen miles, back to Gloucester, not at any time out of sight or sound of surf and sea, you may see at intervals all along your way, the huge derricks that lift the stone from its bed, hear the constantly recurring explosions and the rattling click of the hammers and drills. It was near the starting point of Rockport village that quarries were opened in 1823, almost fifty years ago, by Mr. William Wood of Quincy, who came experimentally to test the out-cropping ledges, and commenced in a humble way the business which has grown to such proportions, in which fortunes are making and have been made. It is here one will see the best stone and the most practical and extensive way of working it. Two companies monopolize the major part of the business on the Southern side of the Cape, though numerous quarries are scattered on beyond, worked by private enterprise, yet seldom going beyond minor matters of the stone trade, underpinning, paving, steps, etc. Of the companies, the Rockport Granite Co. holds first rank, that of Preston, Fernald & Co., second. The former was first known as the firm of Stimpson & Ames, but a few years since was resolved into a joint stock concern, of which, however, the two gentlemen named continue the agents and managers. With the power of a moneyed corporation it is constantly monopolizing smaller and private firms, till at the present time its quarries cover an extent of not less than seventy acres, working five derricks, with all the forcible appliances of steam in hoisting and transportation. The supply of stone is almost limitless; at one point it was worked to a depth of fully one hundred feet, and there the excavation only ceased on account of the continued flowing of water, which powerful rotary pumps worked by engines of six and eight horse power failed to remove. The plan is now adopted of removing the stone as they go to sufficient depth to allow the water to escape by the most natural of all sources, running down hill; a miniature railway is established on which the stone is transported to the wharves, thus doing away partially at least with the stout, eccentric shaped lumber wagons known among the quarrymen as "Gerrymanders." It is remarked that during the early days of quarrying few of the native population engaged in the work, yet soon seeing its developments entered it, generally as workmen, and won their way up from a practical knowledge to be partners, owners, and in many cases wealthy. Without this practical knowledge, half the labor might be misapplied, as to hardly two quarries can be applied the same rules for working the "drifts," as they are termed, traversing the ledges in different courses, sometimes vertically, and again having an "up lift," or horizontal direction, giving the appearance of huge and imposing strata; yet all admitting this one general rule of easier and more correct working the nearer the lines of separation and excavation attain to the four cardinal points of the compass. Laying bare a ledge, the practiced eye determines quickly the side most free, and on that strikes the line for the intended seam. Till within a few years the direction the seam might take was a thing most uncertain, as with but one hole drilled, the explosion, or more properly "blast," might give an irregular course wholly different from that desired. Experience gave wisdom here too, and what is termed the "Lewis hole," is now employed with certain and successful results. Two holes are drilled within a short distance of each other to the required depth, and in line with the desired course, the "bridge" broken partially down by a square blunt instrument, and the charge inserted as usual. With this, accurate seams of almost any desired length are opened, sometimes reaching fifty and sixty feet, and clearing immense masses of stone. The largest ever known to be detached by this process, was in the quarries of Preston, Fernald & Co., and estimated to weigh, from the usual allowance of thirteen square feet to the ton, not less than eleven hundred tons. The first blast does not always suffice to free the stone as much as desirable, and powder is at once poured into the seam and ignited, by simply striking a steel drill across a train led out a short distance for that purpose. It seems a dangerous process, but the workmen merely move aside, crying, "look up." You would ask, why? but the answer comes with the explosion, not heavy enough to throw dangerous particles of stone, but whirling into the air innumerable scales, partially detached by the first blast, and which rising vertically fall in the same direction. Little of the stone removed is dressed at the quarries, but is shipped to be worked more advantageouely at its destination. It ranks under two general heads "Random" and "Dimension" stone, the first being simply irregular masses to be cut as desired, and sold by weight, the second of sufficient size to allow its reaching given dimensions when dressed, and bought by the square foot. Since the stone pavements came in fashion a market has been furnished for previously unsaleable fragments of stone that were deemed useless and thrown aside. The preparation of this comes under the head of job or piece work, whereas the other labor of the quarries is entirely by the day.

The New Orleans paving is most absurd of all, being cut in cumbersome sizes, eighteen inches square, and upon which the straining slippery effect to horse or mule may well be imagined. New York requires an eighteen inch face, with a thickness of six or eight inches, while Boston, most sensible of all, has a neat little cube of about eight inches. These last are sold by count, the others by weight, sometimes passing the scales on the cart ere being shipped, and again weighed on delivery. So much for a brief record of the stone excavated. Where does it find a market? Boston and vicinity, with insatiable maw of paved streets and Back Bay, and public buildings, takes in annually a large balance. Portland, rising from her ashes, makes a levy here. New York and the South make large demands, and into the west and North, even as far as Minnesota, has this strength and power of our rock-bound coast found its way. The transportation, except directly inland, is almost entirely by water; the class of vessels employed, except for long distances being known as stone sloops and peculiar to the trade. The custom is when first entering the service to freight them to their utmost carrying capacity, cause them to be weighed by prescribed government rule, the amount inscribed upon them in due form, to be ever after the criterion by which they are judged. With the variations of trade the number of sloops increases or diminishes; as many as thirty carriers have been in operation regularly and constantly during the summer, and as far as practicable during the winter, though the present force is but two-thirds that number. The stone, particularly of small dimension, to be carried long distances South, finds ready transportation in ships and barques of a large class, which have brought cotton and other produce thence, and would often have to return in ballast were it not for the freight thus furnished.

It would be a work of almost incalculable research to ascertain the exact amount of stone shipped from the quarries of the Cape in a single month, year, or any given time, but an approximation of the sum may be reached in the record of the Rockport Granite Company. In March, last, I think, their exports were forty vessel loads, averaging one hundred tons each, and in the year 1866, the random stone alone taken from their quarries amounted to twelve thousand tons. To ascertain the exact amount of capital invested in the stone trade would require as minute research as in the transportaion; but a fair estimate given by reliable judges fixes it at $550,000, the company just alluded to holding almost one-half, or $250,000. The number of workmen employed varies with the exigencies of the business, so that the record at one time would not be safe or sure criterion to judge at another. The R. G. Co., have at present a force of sixty men; the firm of Preston, Fernald & Co., one-half that number, and scattered over the different quarries is a working force sufficient to raise the total to three hundred and fifty.—*Boston Commercial Bulletin.*

Manufacturing and Mechanical Notes.

No. XXXI.

Hermetic Method of Preserving Wooden Piles and Posts, etc.

The object of this invention is the preservation of wood in contact with earth in the cheapest and most effective manner possible. It is specially applicable to the preservation of bridge, and railroad trestle work, telegraph, gate and fence posts and wooden supports of houses, or to any form of timber set in the ground. The post or timber to be preserved is surrounded by a casting of vitrified stone pipe or tile, or properly manufactured stone or earthen pipe of any kind. The pipe is made an inch or two inches, of inside diameter, larger than the post, which is placed in the centre of the pipe and covered as far as the post is intended to go in the earth, that is, from eighteen inches to two and a half feet, or further if need be. The space between the outside diameter of the post and the inside diameter of the pipe is then filled with a preparation of coal tar or pine wood tar, gravel and sand; this preparation is rammed in properly all around the post inside of the pipe, until it is filled completely to the top. This filling process excludes the air and moisture from the wood, keeping it perfectly dry. Should the wood shrink any, the filling will hug the wood, being sufficiently plastic for this purpose.

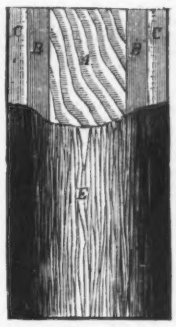

FIG. 1.

The cut, Fig. 1, shows a broken section of a pipe with the wood inside. A, represents the wood; B, the filling inside the pipe and around the wood; C, shows the thickness of the pipe, and E, the outside of the pipe.

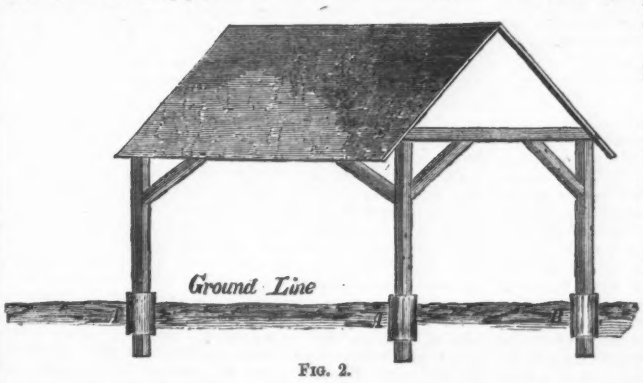

FIG. 2.

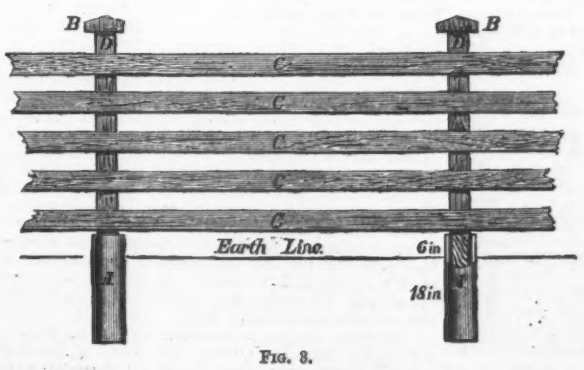

FIG. 3.

Fig. 2, shows the manner in which it is applied to the timbers of buildings when set in the ground, which timber is partially protected, as seen at A, A, and B, or the protection can extend to the lower end of the post, if deemed necessary. This protection is equally applicable and valuable for posts for telegraph and yard purposes, for grape vine arbors, fences and all similar structures, where posts go into the ground. This is shown in Fig. 3, which represents a common board fence with the protection, A A, applied. In and around the cities and villages of the country, expensive fences are constantly being built, that, in from four to seven years are blown down by the wind, from the rotting of the posts in the ground, while the upper part of the fence is perfectly good. Thereby great expense is incurred to replace the posts, and even if the old material, above ground, is used again, it is so much broken and disfigured, as to make it objectionable. Another material advantage is the increase of base by the application of the earthen casing, in most cases doubling the diameter of the end of the post where it is inserted in the ground, thereby adding materially to the stability of the structure.

The invention may be used in sea water infested by Teredo, and it is impossible for Teredo, or any sea animal, to infest the wood thus protected, and the abrasion of the wood by the action of the water is effectually guarded against. Piles of sound timber covered by this method are practically indestructible under water, and with it cheaper wood, as well as smaller sized piles, may be effectually used. The vitrified protection cannot be injured except by actual violence, the water having no effect upon it. Piles can be covered to any required depth and be made to answer for piers, bridges, and other purposes.

Other information respecting this method of preserving wood must be addressed to Jos. WOODWARD, 111 Liberty street, New York City.

Natural Lubricating Oils.

The subject of machine lubricants is of no little importance to the mechanic, and he seeks in an oil that he would apply to his machine bearings, and other surfaces, that require lubrication, freedom from grit, absence of gumming properties and acids, together with a durability of wear. In many manufactories animal oils were excluded and some kinds of the natural or petroleum oils employed in their stead, but from the foreign matter contained in these oils their use was soon discontinued, yet it was universally acknowledged that if a pure natural oil could be obtained it would be just what the mechanic needed. The AMERICAN NATURAL OIL COMPANY, whose office is located at No. 7 Broadway, New York City, have obtained this desideratum, and now present to the public an oil perfectly pure and free from foreign matter, and a glance over the numerous testimonials given in its favor, leads us to decide that it has no equal as a lubricant. It is graded so as to be adapted for factory use where there are high speeds and light bearings, where often the lubricant is fed to these bearings by capilliary attraction, or for high speeds with heavy bearings. Other grades are made that are adapted for car journals and heavy machinery, stationary engines, mowing machines, printing presses, saw mills, etc.; while for the use of locomotives, where heat and exposure to the elements is to be provided against, or for steamships, propellers or rolling mills, in bearings that sustain great weight, there are grades suitably adapted.

This natural oil is as inexplosive as lard or sperm oil, and does not solidify or freeze at a temperature of 18° Fahr., while at this temperature both parafine and sperm oils soon become solid. This is no inconsiderable point in its favor as a lubricating oil for machinery, exposed to degrees of cold. Its good qualities to withstand heat are equally apparent, as it has been used in steam cylinders and valve chests, and does not become thick or gummy. In the cylinders of caloric engines, which are usually very hot, it is found to possess superior qualities, and those who have tried it give it the preference over other oils.

In addition to machine oils, the company prepare axle oils that are warranted superior to any of the greases or pastes so commonly used; they will stand any temperature and keep the axle always cool. They also manufacture a natural wool oil, that will not stain goods, saponifies readily, and washes out freely, without injury to the fibre.

Manufacturing Items from Providence, R. I.

THE CITY MACHINE COMPANY (a new firm) have recently enlarged their buildings. Employ fifty hands, manufacture and repair all kinds of machinery, such as cotton and worsted-speeders, etc.

PAINE & SACKETT have a new cotton mill, and the VALLEY WORSTED MILLS (Carpenter & Cross proprietors) are very busy—running day and night.

PHÆNIX WORKS have been established thirty-eight years. Employ one hundred and sixty hands, make castings, more especially, of all kinds of heavy gearing and heavy machinery generally; have two cupolas, and can make spur and level gearing of the heaviest kind in the best manner—send much work to South America.

MR. GEORGE CORLISS has now, probably, the finest iron foundry in the country.

FENNER & Co. are busy in the manufacture of machinists' tools. They make a neat crank planer with a quick return attachment, centres, jaws, etc., complete.

Ventilation.

General Morin, the head of the Conservatoire des Arts et Metiers in Paris, who more than any man, has made ventilation his study, has laid down that the air of an ordinary sitting room should be renewed five times in an hour. The quantity of air theoretically necessary must depend upon the number of occupants of a room, but the power of the chimney as a ventilating agent is a fixed quantity, and the number of occupants vary; hence the fireplace and chimney must be fized with reference to the probable normal use of the room.

MARKET REVIEW.

FRIDAY EVENING, Sept. 11, 1868.

Gold and Silver Stocks—Prices of all mining stocks show but little variation since our last report. Nevadas continue depressed, but Colorados are commanding better prices. Among the recent sales at the mining board we notice 1,200 shares of Quartz Hill at 93; 500 Grass Valley at 39, and 600 New York Gold, s.60, at 10c. Prices are thus quoted at the board:

	Bid.	Asked.		Bid.	Asked.
Alameda Silver	— —	— 50	Kipp & Buell Gold	— —	— 10
American Flag	— —	— 40	Keystone Silver	— —	— —
Atlantic and Pacific	— —	— 50	La Crosse Gold	— 27	30
Benton Gold	— 25	— 35	Liberty Gold	— —	— 6
Bates & Baxter Gold	— —	— 75	Liebig	— —	— —
Black Hawk G	— —	7 00	Manhattan Silver	115 00	130 00
Bobtail Gold	— —	1 25	Midas Silver	— —	— 50
Bullion Consolidated	— 40	1 00	Montana Gold	— 55	— 60
Burroughs G	— —	— —	New York	— 85	— 95
Columbian G. & S.	— 4	— 10	New York & Eld'o	— —	— 75
Combination Silver	7 00	10 00	Nye Gold	— —	— 3
Consolidated Gregory	3 95	4 05	Oxyacee Mining	15 00	30 00
Coryoon Gold	— —	— 30	Con. Colorado	— —	— —
Edgehill Mining	— —	3 60	People's G. & S. of Cal	— 6	— 12
Empire G	— —	— —	Quartz Hill	92	— 94
Gold Hill	— —	1 00	Reynolds Gold	— —	— 4
Grass Valley	— 38	— 40	Rocky Mountain Gold	— —	— 10
Gunnell Gold	— 50	— 80	Smith& Parmelee Gold	4 25	4 50
Gunnell Union	— —	— 35	Sensenderfer	3 00	8 00
H'n G & S. bs	— —	— 85	Symonds Fork Gold	— —	1 00
Harmon G. & S. bs	— —	3 00	Texas Gold	— —	— 10
Holman	— 4	— 10	Twin Riv Sil	— —	25 00
Hope Gold	— —	— 15	Vanderburg G	— —	— 75

Copper Stocks.—A slight improvement is noticeable in some two or three stocks, prices being thus quoted:

Caledonia		5 00	Gardiner Hill	6	50
Canada		50	Hilton	50	1 00
Charter Oak		1 00	Knowlton		2 00
Central		35 00	Minnesota		
Davidson		50	Mendota	1 75	3 50
Evergreen Bluff		10 00	Rockland		4 00
Flint Steel River	1 75				

Petroleum Stocks.—Sales of Buchanan Farm were reported to-day at 60, and of Rynd Farm at 20 cents. Prices generally have advanced, and are thus quoted:

	Bid	Ask'd.		Bid.	Askd.
Bonnchoff Run	50	1 05	N. Y. and Alleghany		2 25
Brevoort	75	1 00	Pit Hole Creek	50	1 00
Buchanan Farm	53	60	Rynd Farm	20	25
Central	40	80	Second National		
Continental	1 20	1 75	Sherman & B	1 02	2 00
Empire & Pithole			Tarr Farm		
Home	1 00		United Pet. Farms		
Manhattan		5	Union	5 00	
National		3 00	United States	2 30	2 50

Miscellaneous Stocks.—Wallkill Lead is quoted at 8@12; Rutland Marble, $16; Mariposa, 1st new, 16c; Western Union Telegraph, 34c.; Mariposa preferred, 11c.; Pacific M. S., 102@102½; American Express, 43¾; Adams Express, 48½@49; U. S. Express Co., 44½; Merchants' Union Express, 22¼; Iris Railroad, 47¼; Nor. & Wor. R., 92; Reading Railroad, 90@90¼; M. S. & N. I., 83½@84; Chicago and Northwestern pref., 87¼; M. & St. Paul, 91; Mil. & St. Paul pref., 91½@91½; Toledo, W. & Western, 57½; Stonington R., 89; P. Ft. Wayne & Chicago, 107½; Ohio & Miss., b 30, 28½; Chicago & Alton, 165; Chicago & Alton pref., 150@157; New Jersey Central, 123.

Government Stocks.—United States securities continue strong at slightly advanced rates.

U. S. 6s, 1881, coupon	114⅛@114¼
U. S. 5-20s, 1862, coupon	113¾@113⅞
U. S. 5-20s, 1864, coupon	109¾@109⅞
U. S. 5-20s, 1865, coupon	111⅛@111¼
U. S. 5-20s, 1867, coupon	108¾@109
U. S. 5-20's, 1868, coupons	108⅞@109
U. S. 5-20s, July, 1865, coupon	108¾@109
U. S. 10-40s, ex. coupon	104¾@105

Foreign Exchange is steady at a fraction lower than at the time of our last report. There is an improved supply of produce bills, and rather more demand from remitters. We quote:

London, (prime bankers')60 days'	109¼@109¼
London, (prime bankers') sight	109½@109⅝
London, prime commercial	108½@108⅝
Paris, (bankers') long	5.18¾@5.16⅛
Paris, (bankers') short	5.16⅛@5.14¾
Antwerp	5.20 @5.18¾
Swiss	5.20 @5.18¾
Hamburg (bankers')	35¼@34⅞
Amsterdam (bankers')	40⅛@40¼
Frankfort (bankers')	40¼@40⅜
Bremen (bankers)	79¼@79⅝
Berlin (bankers)	71½@71⅝

Gold.—Gold opened this morning at 144⅜, advanced to 144⅝, and closed at the opening price. From ⅛ to 5 per cent. was paid for carrying.

The money market is steady at 4 per cent. as the ruling rate on call loans, with exceptional transactions at 3@5 per cent. The banks report an easier demand for currency from the West, but have their resources generally well employed. The private bankers are holding a considerable amount of funds belonging to the interior, which have not, so far, been much disturbed, and the employment of these liberal deposits are a main cause of the persistent ease in rates.

Discounts are fairly active at 6½@7 per cent. for prime three and four months' paper.

American silver is selling at 7@7¼ cents below the price of gold. Mexican dollars are dull at 102¼a103 in gold.

The San Francisco *Market Review* of August 29, received overland, has the following remarks on the money market of that city:

"Our local money market is active, evincing a brisk demand for money for legitimate operations. Building improvements, large real estate transactions, railroad enterprises, moving the crops, and the rapid expansion of all business pursuits, employ a vast amount of capital, which is kept constantly in motion, and imparts a healthy vigor. Bank rates seem to have become chronic at 1al¼ per cent. per month for call loans. Gold bars are weak at 880a890; silver bars rule from par to ¼ per cent. premium; currency bills on Atlantic cities have declined from 92a95, at the date of our last issue, to 41@42½ per cent. premium on gold; sight drafts, payable in coin, are quotable at ¾@1 per cent. premium; telegraphic transfers, 1@1¼ per cent. premium; sterling exchange, 48@49d.; commercial exchange, 49¼@49½d. There is nothing doing in Mexican dollars."

The shipments of treasure from San Francisco from August 1 to date (exclusive of Government account) have been as follows:

August 3—Per Japan—	
To China	$875,883 19
To Japan	2 000 00
	$877,883 19
August 5—Per Nevada to New York	215,000 00
August 6—Per Sacramento—	
To New York	499,375 51
To Panama	15,000 00
	$5:4,375 51
August 14—Per Montana—	
To New York	179,207 78
To England	141,416 66
To France	32,587 17
To Panama	10,000 00
	$363,211 01
August 20—Per Oregonian to New York	125,000 00
August 21—Per John L. Stephens to Victoria	20,000 00
August 22—Per Constitution—	
To New York	172,947 09
To England	2,6,800 84
To Panama	15,000 00
	$414,747 93
Total since August 1, 1868	2,530,222 64
Previously this year	23,231,910 12
Total since January 1, 1868	$25,762,132 76
Corresponding period of 1867	27,500,547 88
Decrease this year	$1,738,415 12

Copper—Is quiet and some sales have been made at lower figures. There is little offered, and the transactions are small. Detroit may be quoted at 23¼c.; Portage Lake, 23¼c. and Baltimore, 23¼@23½c.

The English market was quoted at £67 for Chili bars.

Tin.—There has been cosiderable business, partly on speculation. Sales here and in Boston foot up 10,000 slabs straits on private terms. It is quoted to-day at 24@24¼c. gold. Banca, 26¾. English 24c.

The London market is unchanged and steady at 93 shillings sterling.

Spelter is dull and nominal at 6¼c. to 5 30-100c. gold for Silesian,

Lead.—There is a good demand for manufacturing. Sales foot up from 400 to 500 tons ordinary foreign at 6 30-300 to 6¾c. gold.

Petroleum—Is quiet at 15½c. for Crude, and 30½c. for Refined, in bond.

Receipts for the week ending Sept. 8	pkgs.	11,977
Exports for the week	gails.	1,768,115
Do. from January 1	do.	37,132,192
Do. same time last year	do.	19,783,527

The following is the quantity exported from other ports, Jan. 1 to Sept. 5;

	1868.	1867.
From Boston, galls.	1,676,195	1,435,621
Philadelphia	24,829,012	19,427,548
Baltimore	1,812,882	1,090,300
Portland	512,970	....
Total	28,834,089	21,953,469
Total exports from the United States	67,167,432	41,590,031
Same time in 1866		38,518,427
Same time in 1865		12,536,485

THE IRON TRADE.

NEW YORK, Sept. 11, 1868.

Sales of 400 to 500 tons of American Pig Iron have been made since our last report, at $43 for Allentown, and $42 for Roberts'.

Scotch iron remains quiet, with small sales at $43 for Glengarnock, and $41 for Cartsherrie ex ship; Old Rails, sales have been made of 900 tons Old T's at $33, gold; 400 tons Old Double Heads on private terms; 400 tons to arrive at Philadelphia, at $48. Scrap iron remains quiet, with but little inquiry. Sales 100 tons ex ship $45; 75 tons old plate at $44.

Holders of Bar in store are firm at our quotations given elsewhere, but there is little doing; we hear of no invoices offering.

Import from Jan. 1st to Aug. 31st, 1868:

	Bar.	Pig.	Sheet.
From Foreign Ports, tons.	7,257	tons. 18,808	bdls. 142,980
Coastwise	1,170	37	11,398
Total, tons.	8,427	tons. 18,845	bdls. 154,378
Same time, 1867	13,101	36,713	330,156

BOSTON, September 5th.

Pig Iron remains quite steady and firm, but demand moderate, and transact ons confined to small lots. We quote sales of Scotch, Cartsherrie, Coltness, and other brands. No 1 at $42@$45 per ton; and American Pig has been selling at $40@45 per ton. In Bar Iron the sales have been confined to small lots, and we quote $85@$90 per ton for common English or American, and $95@$100 per ton for refined. Russia Sheet Iron is firm at 13@14c. per lb. gold.

Imports of Pig Iron from January 1st to August 29th.—

	1868.	1867.
From Great Britain, tons	10,862	22,804
Coastwise Ports	9,747	6,226

PHILADELPHIA, Sept. 8, 1868.

Pig metal is held firmly, but there is not much activity. Sales of No. 1 Foundry at $40@42, and No. 2 at $37@38. Scotch Pig is quiet. Manufactured Iron commands $57 50 for bars. Blooms are neglected.

Lehigh Valley Iron Trade.

The following table shows the amount of Pig Iron transported over the Lehigh Valley Railroad for the week ending Sept. 5, 1868, and for the season to that date.

From	Week. Tons.	Season. Tons.
Carbon Iron Co	10	5,670
Lehigh Valley Iron Co	229	7,580
Thomas Iron Co	260	20 315
Lehigh Crane Iron Co	429	17,715
Allentown Iron Co	720	14.160
Robert Iron Co	125	6 630
Glendon Iron Co	270	16,310
Other shippers	300	14,097
Total	2,325	103,277

Lake Superior Iron Trade.

Receipts of Ore and Pig Iron at Marquette, up to and including Saturday August 29, 1868, by the Marquette & Ontonagon Railroad.

IRON ORE.

	Previously reported.	For past week.	Total.
Lake Superior Iron Co	61,817	4,244	66,061
Cleveland Iron Co	23 200	1,597	24,797
Marquette Iron Co	6 465	446	6,911
Washington Iron Co	17,537	1,097	18 634
New England Iron Co	4,462	655	5.117
Edwards Mine	8,756	1,388	10.144
Pittsburg & Lake A. Iron Co	16,848	997	17,845
Ore to Local Furnaces	14,886	865	15,721
Total Iron Ore, tons	.154,031	11,199	165,230

PIG IRON.

Morgan Iron Co	5,377	238	5,615
Greenwood Iron Co	328	....	328
Bancroft Iron Co	2 261	175	2,436
Collins Iron Co	2 735	269	3,004
Michigan Iron Co	3,139	240	3,379
Total Pig Iron, tons	13,840	922	14,762
Total ore and pig iron, tons	.167,871	12,121	179,992

Market Prices.

NEW YORK, Sept. 11, 1868.

DUTY.—Bars, 1 to 1¼c. per lb.; railroad, 60c. per 100 lbs.; boiler and plate, 1½c. per lb.; sheet, band, hoop and scroll, 1¾ to 1¾c. per lb.; pig, $9 per ton; polished sheet, 3c. per lb. Payable in gold.

Am. pig, fy. No. 1, best	$49 00@43 00	
" " 2x, fdry	35 00	39 00
" Grey Forge	32 00	35 00
White and Mottled	30 50	31 00
Pure white, for Cal. mar.	31 00	— —
Scotch Pig, No. 1, best bd	43 00	45 00
" " " outside	43 00	— —
Scrap Iron, ex ship	46 00	— —
Old rails	46 00	49 00
R.R. Iron, For., fm stock gold	51 50	52 50
R R. Iron, For., to imp.	59 00	— —
" " Amer, at wks. currency	77 00	— —
R.R. Iron, Am., deliv'd.	89 00	— —
Solid Steel rls. For, gd.	110	— —
Steel rails of any pattern at works, currency	89 00	— —
Steel rls of any pat. d. here	83 50	— —
Light rls for mines &c., at works	89 00	— —
Do. delivered here	83 50	— —

STORE PRICES.

Bar, Swedes, ord'y sizes	— —	155 00
Bar, Eng. and Am., r'd	— —	100 00
Bar, Eng. & Am., com.	— —	90 00
Scroll	130 00	175 00
Ovals and half round	125 00@	155 00
Band	130 00	— —
Horse Shoe	130 00	— —
Rods, ⅝@3-16 inch	105 00	165 00
Hoop	135 00	160 00
Nail Rod, per lb	9¼	10½
Sheet, Rus, as'd. Nos. (gold)	13	14
Sheet, s'gle, D. & T. com	5¼	6¼
Rails, Eng., gold, ton	51 50	52 50
Rails, American	89 00	81 00

STEEL.

English, cast (2d and 1st quality) per lb	18 @23
English spring (2d and 1st quality)	10 @12¼
English Blister (2d and 1st quality)	11½ 20
English Machinery	13½ 16
English German (2d and 1st quality)	14 16
American Blister, "Black Diamond,"	10½ 16
American, Cast, Tool " "	19 —
American, Spring " "	10 13
American, Machinery " "	— 13
American German " "	10 13

MILWAUKEE, Wisconsin, Sept. 7, 1868.

PIG IRON.

Arrivals continue to be very light, hardly keeping pace with the requirements of manufacturers, while they are using considerably less than was anticipated early in the season.

Buffalo Union, A. 1	$49 00
Buffalo Union, B. 1	46 00
Lake Superior No. 1 (charcoal)	45 00
Lake Superior No. 2 (charcoal)	42 00
Lake Superior No. 3 (charcoal)	43 00
Iron Ridge, No. 1 (Sweed's)	43 00
Scotch	43 00@53 00

MANUFACTURED IRON.

Flat Bar	$0 3¾@$0 4¼
Horse Shoe	5 5¼
Heavy Band	4½ 5¼
Hoop and light band	5 10
Eagle sheet iron	6¾ 9½
Boiler sheet iron	5¾ 6¾
Round and square	3¾ 7¾
Oval	4½ 5
American spring steel	11½ 13½
Plough steel	11½ 13½
American tool steel (best)	17½

IRONTON, O., Sept. 3, 1868.

The *Register* says: The upward tendency of metal in markets abroad is stiffening the views of holders at this point. They apprehend a slight advance soon. Inquiries are rather more numerous than at our last reports, though the transactions are not very heavy. In consequence of low water, the stocks are becoming slightly increased. We quote:

Mill, hot blast	$36 00@37 00
Foundry, hot blast	38 00@39 00
Cold Blast	55 00@60 00
Bituminous forge (Belfont)	— — 37 00

Bar is growing more active, but the rates continue so extremely low that the profits are not large. There are rumors afloat that the Ironton rolling mill will start up soon, but we have not been able to trace the reports to any reliable source.

Nails continue in good demand at $4 60 for 10d. The Belfont furnace is now in magnificent running order.

From the Pittsburgh Commercial.

PITTSBURGH, September 5, 1868.

The market for crude iron continues firm, with a fair demand. The supply of certain brands being limited, sales were of a similar description. From present appearances we are clearly of the opinion that the advantages of the market continue on the side of the holders.

The sales were: Anthracite, 651 tons; Coke—Allegheny and Youghiogheny, 320 tons; Charcoal, 810 tons; Bituminous Coal smelted from Lake Superior ore, 329 tons. Total, 2,120 tons.

ANTHRACITE.

100 tons No 3 Forge,	36 00—cash.
50 tons No. 3, Open Forge	37 00—cash.
80 tons Whit	33 00—cash.
30 tons No. 2, Open Forge at furnace	33 00—cash.
40 tons No. 2 Foundry,	38 50—60 dys
11 tons No 2 Foundry	38 00—cash.
10 tons No. 2 Forge	39 00—4 mos.
20 tons No. 1 Foundry	40 00—4 mos.
20 tons No. 1 Foundry Extra	43 00—4 mos.
200 tons No. 2 Foundry	42 00—4 mos.
60 tons No. 3 Red Short, hard	38 00—4 mos.
30 tons Gray Neutral	36 50—cash.

ALLEGHENY COKE.

100 tons Allegheny Coke	38 00—6 mos
100 tons Allegheny Coke	37 50—cash.
100 tons Youghiogheny No. 3	56 00—cash.
29 tons Youghiogheny No. 2	40 00—cash.

CHARCOAL.

200 tons Extra No. 1 Foundry, H R	45 00—5 mos.
180 tons Extra Forge, Cold blast	53 00—4 mos.
400 tons Extra Forge, Hot Blast	44 50—6 mos.
10 tons Foundry, H. R	44 00—4 mos.
20 tons No. 1 Foundry	45 00—4 mos.

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORES.

87 tons Gray Forge, at furnace	37 00—6 mos.
92 tons Silvery, at furnace	35 00—4 mos.
150 tons Inferior White	35 00—4 mos.

CINCINNATI, Sept. 7, 1868.

IRON.—There is an improved demand, with a firmer feeling in the market. A disposition to buy more freely is evinced by manufacturers.

	Per Ton.	
Hanging rock H. B. mill	$36	$38—90 days.
" " H. B. foundry	38	40—90 days.
" " Cold Blast	53	—90 days.
" " Car Wheel	55	60—90 days.
Tennessee Cold Blast	40	42—90 days.
Missouri	45	47—90 days.
Jackson (stonecoal) Foundry	38	39—90 days.
Blooms	95	100—60 days.

MANUFACTURED.—Prices steady, with moderate demand.

	B.		C.	C.
Flat bar	3¾	4¼	5	5½
Horseshoe iron	5¼	5¾	6½	7
Heavy band	4½	4¾	5¾	6
Round and square	3¾	7¾	5	9
Saddle-tree	5	5¾	6¼	7
Hoop and light band	5	9½	6¼	10¾
Oval iron	4½	5	5½	6½
Half oval and half round	4½	5½	5¾	6½
Angle iron	5½	6¼	6½	7½
T and hollow rail iron	5¾		7	
Saw-mill track	5¾		7	
Sheet iron 10 to 17	5		8	
Sheet iron, 27	6		9	
Boiler plate, 3-16 to 5-16			6¾	

SAN FRANCISCO, CAL., Aug. 14, 1868.

The general metal market, says the *Commercial Herald*, is well supplied with all the varied kinds and descriptions, and for which the consumptive demand is considerable and at remunerative prices to the dealers. For Pig Iron, however, the market appears sadly demoralized, with sales of Scotch here and to arrive to the extent of several hundred tons, at $37 50; and at this rate round parcels are offered at the close.

Scth. & Eng. pig, ton	35	—@37 50	Plate, 5 to 0	—4 a4½ —
Am. white Pig	35	—@— —	Sheet, 10 to 13	—4 a5— —
Rel'd bar, bad assm't, lb	2½	@3 —	Sheet, 14 to 20	—5 a5½ —
" gd. assm't, lb	3¾	@4 —	Sheet, 24 to 27	—5 a5½
Boiler, 1 to 4	—4	@4½—		

IRON.—In Staffordshire, says the Mining Journal, orders for finished iron come in steadily, and, so far, justify the hope that a permanent improvement has set in, and, as the weather is now cool, full time will, no doubt, be made, should orders continue sufficient. In Welsh the signs of improvement are gradually becoming more evident. Home buyers, whose stocks are known to be low, are entering the market with greater freedom, though the contracts given out up to the present time are not for heavy quantities. On American and Russian account there is a fair business doing, and there are several vessels now loading for those markets. Last month the exports reached 9,147 tons, of which New York took 1,450 tons, New Orleans 2,111 tons, and Cronstadt 1,764 tons. In Swedish iron there is not quite so much doing; several parcels are now here and arriving ready to suit the various specifications required by buyers. In Scotch pig iron there has been very little animation in the market, and prices have varied only in a slight degree, the last prices received from Glasgow being 52s. 7½d cash, and 52d. 10½d. one month.

STEEL.—Very little business now doing.

LONDON, August 22, 1868.

Bars, Welsh in Lond.	£6	7 6@..	Do. railway, Wales.	£5	17 6@£6 0 0
Ditto to arrive	6	5 0 6 5 0	Do. Swd. in London	9	17 6 10 2 6
Nail rods	6	15 0 7 0 0	To arrive	10	0 0 10 2 6
" Stafford in Lond.	7	10 0 8 10 0	Pig, No. 1, in Clyde	2	12 0 2 17 3
Bars	7	5 0 9 10 0	Do. f.o.b, Tyne, Tees	2	9 6 .. ....
Hoop	8	2 6 9 15 0	Do. Nos 3, 4, f.o.b. do	2	6 6 2 7 0
Sheets, single	9	0 0 11 0 0	Railway chairs	5	10 0 5 15 0
Pig, No. 1, in Wales	3	15 0 4 5 0	" spikes	11	00 0 12 0 0
Refined metal, ditto	4	0 0 5 0 0	Indian Charcoal Pigs		
Bars, common, ditto	5	12 6 5 15 0	in London, pr. ton	7	0 0 7 10 0
Do. merch. Tyne or Tees	6	10 0			

STEEL.

Swed., kegs (rolled)	14	5 0	Swed., in faggot	16	 0
" (hammered	14	15 0 15 00 0	English, spring	17	.. .. 23 .. 0

THE COAL TRADE.

NEW YORK, Sept. 11, 1868.

The tone of the market this week has been active and supply is much behind the orders on file. The advance in price has stimulated the demand. From the coal regions we have news of two or three small strikes, but nothing that will just now affect the market. From the Williamstown colliery of the date of the 5th inst., we received the laconic item that "the men were on a strike, and that their breaker had worked but one day." The Philadelphia market seems to be in a feverish state, but this will probably abate as coal goes forward and old orders are filled. We also learn that Philadelphia shippers are not as willing to sell as the Eastern trade is desirous to buy. At Baltimore the market is active. Anthracite is firm; Cumberland is in brisk demand for shipping, with many unfilled orders. The N. C. railway has advanced the tolls slightly on Coal shipped from Sunbury, Trevorton and Millersburg to Baltimore. The advance, which is from 15 to 20 cents per ton, took place on the 15th inst., and restores the tolls to the charges in June last. The Baltimore & Ohio Railroad are not working to full capacity. The lessening of the drawbacks on Coal shipped East from Port Richmond on the 1st inst. has advanced the prices of Coal on board vessels to the same figures. The drawback of 20 cents per ton on Coal sent by Canal east of New Brunswick, N. J., has been removed, and freights to New York have advanced 10 cents, and to other places 5 cents per ton.

BOSTON, Sept. 5, 1868.

English Cannel continues quiet, and prices are nominally $18@20 per ton. In Sidney and Pictou there have been cargo sales at $8@8 25 per ton. Cumberland has been sold at $8 here. Anthracite has been in good retail demand at $7 50@8 per ton, and by the cargo at $6 50@7.

PHILADELPHIA, Sept. 8, 1868.

There is rather more doing, and prices generally are steady.

Schuylkill Coal Trade.

BY RAILROAD AND CANAL, FOR THE WEEK ENDING SEPT 11, 1868.

	RAILROAD.	CANAL.
St. Clair	....	....
Port Carbon	7 950	6,224
Pottsville	2,559	1,592
Schuylkill Haven	33,459	18,958
Auburn	3,594	....
Port Clinton	13,006	10,063
Company's use	3,107	.....
Total for Week	63,625	37,037
Previously this year	1,934,286	532,077
Total	1,997,911	569,114
Same time last year	2,261,931	679,054
Decrease	264,020	89,940

The following table exhibits the amount of Coal that was passed over the various routes of transportation from the Pennsylvania Coal districts for the week ending September 5, 1868, and for the season to that date. A com-

parison is also made with the amounts transported the corresponding week in 1867, showing the increase or decrease, as the case may be.

	1867.		1868.		INC. OR DEC	
	WEEK.	TOTAL.	WEEK.	TOTAL.	WEEK.	YEAR.
Phil. & Reading R. R.	63,900	2,191,198	90,689	1,934,286	i 26,789	d256,192
Schuylkill Canal	20,768	631,464	28 508	534,637	i 7,740	d 99 427
Lehigh Valley R. R.	39.163	1 111,179	50,387	1,584,754	i 11 223	i 172,974
Lehigh Canal	3,939	508,350	35,931	550.337	i 1,991	d 48 013
Scranton North	12,677	294,019	16,374	370,007	i 3,837	i 75 987
" South	24,417	882,446	23.535	739,239	d 882	d143,207
Penn'a Coal Co. Rail.	20,202	551,591	21,207	614 390	i 1,005	i 62,769
Penn'a Coal Canal	711	14,535	948	19,028	i 238	i 4,493
Del. & Hudson Canal	42,627	894,594	49,073	1,030,213	i 9,490	i 135,619
Shamokin	10.087	320,906	12,226	325,638	i 2,139	i 4,731
Trevorton	554	30,193	1,250	17,525	i 695	d 13 232
Short Mountain	696	44,494	3,521	73.089	i 2,824	i 24,594
Lykens Valley C. Co.	1,094	43,216	2,211	58,653	i 1,116	i 15.437
Huntingd'n & B'd Tp	4,608	161.005	6,837	172.250	i 2.229	i 11,125
W'mstown Col'y, E.	1.384	76,634	2,263	120,115	i 879	i 43,480
Wyoming South	13,409	208,407	9,105	182,909	d 4,304	d 25 578
Wyoming North		13.133	5,134	35,087		i 21,954
Lehigh & Susq. R.R.	10,410	352 427	30,790	565,848	i 20,380	i 213,421
Total	270,612	8,524,614	436,229	7,935,853		
		7,935,855	270,612			
Increase		588,759	145,617			

Lehigh and Susquehanna Railroad, Week ending September 5.

WHERE FROM	WEEK. Tons. Cwt.	TOTAL. Tons. Cwt.
WYOMING REGION.		
New England Coal Co	62 07	175 04
Newport Coal Co		
Valley Coal Co		
Warrior Run Mining Co		
Parrish & Thomas	355 03	8,970 04
New Jersey Coal Co	68 09	10.267 16
Gaylord Mines		224 11
Albrighton, Roberts & Co	451 07	7.373 16
Lehigh & Susquehanna		15 10
Germania Coal Co		14,307 09
Franklin "		233 06
Wilkesbarre Coal & Iron Co	10,532 19	170,510 12
Union Coal Co		2,040 07
Mineral Spring		6,655 17
H. B. Hillman & Son		1,303 17
Bowkley, Price & Co	210 14	735 05
Wyoming		3 312 01
Henry	314 16	4,789 05
J. H. Swoyer	197 09	3,268 02
Lances' Colliery	252 11	1,357 00
Morris & Essex Mutual		78 19
Shawnee	745 09	12.890 10
Delaware & Hudson Co	542 09	7,074 13
Pine Ridge Colliery	400 08	4,555 01
Consumers Coal Co	140 02	3,024 15
Harvey Brothers		184 11
Other Shippers		6,500 13
Total Wyoming Region	14,778 02	269 079 08
UPPER LEHIGH REGION.		
Upper Lehigh	3,097 16	77,239 18
Other Shippers	237 12	7,730 07
Total Upper Lehigh	3,335 08	85,020 05
HAZLETON REGION.		
A Pardee & Co	2,280 00	45,106 16
Linderman & Skeer		1,043 06
Sharpe, Weiss & Co	1,825 15	27,644 06
W. S. Halsey & Co		1,701 09
Harleigh Coal Co	184 07	19 310 16
G. B. Markle & Co	2 316 02	31,845 08
Ebervale Coal Co	1,179 16	19,680 12
Stout Coal Co		9,047 06
Buck Mountain Coal Co	1,924 07	14 571 19
Coxe Brothers & Co	674 02	7 078 00
Ashburton Coal Co		64 06
Highland Coal Co	734 01	11,159 13
Pardee Bro. & Co	95 18	5,382 10
Jeddo Coal Co	232 04	6,010 14
Mount Hall		
Other Shippers		927 02
Total Hazleton	10,549 12	200,574 12
FROM MAUCH CHUNK.		
Summit Mines		
Room Run Mines	2,127 05	10,351 16
Other Shippers		17 00
Total Mauch Chunk	2,127 05	10,374 11
" Hazleton Region	10,549 12	200 574 12
" Upper Lehigh	3.335 08	85,020 05
" Wyoming	14,778 02	269,079 08
Grand Total	30,790 07	565,848 16
Corresponding week last year	10,410 04	352,427 04
Increase	20,389 03	213,421 12
Decrease		
Forwarded South from Mauch Chunk by rail	12,699 18	241,182 18
Delivered on line L. & S. R.R. above Mauch Chunk	1,193 00	49,739 19
Delivered at Coal Port for shipment by Canal	16,987,09	274,134 19
Total	30,799 07	565,848 16

Report of Coal Transported over Lehigh Valley Railroad

For the week ending September 5, 1868, and previously this season, compared with same time last year :

Where shipped from.	WEEK. Tons. Cwt.	PREVIOUSLY. Tons. Cwt.	TOTAL. Tons. Cwt.
Total Mahanoy	11,564 01	292,'67 13	303,735 14
Total Hazleton	21,397 09	733 349 06	754,746 15
Total W. Lehigh	214 09	33.117 01	33,361 10
Total B Meadow	10,930 19	285,116 05	296,047 04
Total Wyoming	6,246 05	190,013 17	196,260 02
Grand total	50,387 03	1,533,764 02	1,584,151 05
Same time last year	39,163 18	1,372,013 0'	1 111,177 03
Increase	11,223 05	131,750 17	172,974 02
Decrease			
Forwarded East from M Chunk by r'l	50,387 03	1,533,764 02	1,584,151 05
Delivered at M. C'k and on line of r'd above that point	3,774 05	26,511 11	30,285 19
At Penn Haven for shipm't by canal	8,981 15	84,516 14	93,498 06
At M. Chunk for shipment by canal	5,453 09	48,142 15	53,696 04
Total by rail and canal	68,696 12	1,692,935 02	1,761,631 14
Same time last year	44,258 12	1,436,510 03	1,480,768 15
Increase	24,438 00	256,424 19	280,862 19
Decrease			

Cumberland Coal Trade.

By B. & O. RAILROAD.—The shipments over the Baltimore and Ohio Railroad, for the week ending Sept. 5, were as follows :

From Cumberland and Pa. Railroad, via Cumberland.	
Consolidation Company	2,112 12
Borden	1,603 17
Midland	746 17
Allegany	81 01
From George's Creek, via. Piedmont.	
George's C. & I. Company	2,161 18
Central	1,904 05
Atlantic	864 05
Savage Mt	46 13
Franklin	881 09
Piedmont	915 08
Swanton	620 03
Potomac	1,549 00
Hampshire	1,906 11
American	880 10
Barton	536 05
Total	16,810 17
From Eckhart R. R.	
C. & I. Co	3,247 00
Total	20,057 17

BY C. & O. CANAL.—There were despatched from this port, during last week, 16,024 12 tons of Coal, forwarded by the following companies :

American	3 325 12
Borden	1,751 14
Central	3,898 12
Consolidation	2 647 02
C. & I. Co	1,984 07
H. & B.	1 394 10
National	1,022 15
Total	16,024 42

Report of Coal Shipped by Lehigh Canal,

Week ending Sept. 5, 1868, compared with same time last year :

WHERE FROM.	Week. Tons. Cwt.	Total. Tons. Cwt.
Mauch Chunk Region	13.823 19	217,182 11
Beaver Meadow Region	4,866 00	51,523 18
Mahanoy Region	90 16	1.634 09
Hazleton Region	8,981 11	162,237 07
Upper Lehigh Region	883 16	10.807 03
Wyoming Region	7,289 11	106 951 17
Total	35.931 13	550,337 05
Corresponding week last year	33,939 17	598,350 10
Increase	1,991 16	
Decrease		48,013 05

Prices of Coal by the Cargo

[CORRECTED WEEKLY.]

At New York, September 11, 1868.

Schuylkill R. A., choice	$5 75@$	....	Schuylkill Chestnut	4 50	....
" Ordinary	5 50	....	Lehigh W. A Lump Old Co	5 62½	....
" W. A., Lump	5 50	....	Lehigh Broken	5 57½	....
" Steamboat	5 00	....	" Egg	5 37½	....
" Broken	5 50	....	" Stove	5 62½	....
" Egg	5 €0	....	" Chestnut	4 87½	....
" Stove	5 75	....	Shamokin	5 50	....

SPECIAL COALS.—DEALERS' QUOTATIONS.

Diam'd Vein R. A., Sch'kill	7 00	....	Old Co.'s W. A. Lehigh	5 38	6 50
Locust Dale W. A., "	6 50	....	Mt Pleasant	....	....
Honey Brook " Lehigh	6 25	6 50	Buck Mountain	5 38	6 38
Harleigh " "	6 50	....	Buck Ridge W. A., Sh'kin	6 75	....
Spring M'n " "	5 25	6 25	H. Heils, E. S'klin, Lorb.	5 75	....
Sugar Creek " "	6 25	6 50	New England Red Ash	6 25	....
Ashburton " "	....	....	Wyoming	6 00	6 25

Dealers in these Coals may be found in our advertising columns

At Philadelphia, September 11, 1868.

Lehigh Lump and Sl'mb't.	5 50@	....	Henry Clay, Egg & Stove		@1 50
" Broken and Egg	5 50	....	Locust Mount Lump	4 25	4 50
" Stove	6 00	....	" Steamboat	4 50	4 75
" Chestnut	4 75	....	" Broken	4 50	4 75
Schuylkill R. A.	5 25	5 60	" Egg	4 50	4 75
" Chestnut	4 00	4 25	" Stove	5 00	5 25
" W. A. Lump	4 25	4 50	Lorberry Coal	5 00	....
" Broken	4 50	4 75	Shamokin	....	....
" Egg and Stove	4 50	4 75	Franklin, (Lykens Valley)	5 50	....
Schuylkill Chestnut	4 00	4 25	Broad Top	5 00	....
Hill & Harris, Egg & Stove	....	4 80			

Scranton Coal at Elizabethport, September 11, 1868.

(Corrected weekly by D. L. & W. R. R. Co.)

Lump	$4 75@	....	Egg	5 75	....
Steamer	5 25	....	Stove	5 75	....
Grate	5 50	....	Chestnut	4 75	....

Prices for Pittston Coal at Newburgh, September 11, 1868.

(Corrected weekly by Penna. Coal Co.)

Lump, per ton of 2240 lbs.	$5 10@	....	Egg " " "	5 10	....
Steamer, " " "	5 00	....	Stove " " "	5 35	....
Grate " " "	5 10	....	Chestnut " " "	4 55	....
Pea " " "	3 25	....			

70 cents additional to New York.

Lackawanna at Rondout, September 11, 1868.

Lump	$4 75@	....	Egg	$5 25@	....
Steamer	5 10@	....	Stove	5 50	....
Grate	5 20@	....	Chestnut	4 50	....

65 cents additional to New York.

Lehigh Coal at Elizabethport, September 11, 1868.

Lump	6 25@	....	Chestnut	5 60	....
Steamboat and Broken	5 75	....	Stove	6 25	....
Egg	5 75	....			

Wilkesbarre Coal at Hoboken, September 11, 1868.

(Corrected by Wilkesbarre Coal & Iron Co.)

Lump	$5 50@	....	Egg	5 75@	....
Steamer	5 75	....	Stove	6 00	....
Broken	5 75	....	Chestnut	5 25	....

At Baltimore, September 11, 1868.

Wholesale prices to trade.		Trevorton R. A	$5 25@$5 50
Wilkesbarre by cargo or car load	$5 85@6 00	By retail, per ton of 2,240 lbs., delivered	7 00@ 7 50
Pittston and Plymouth	$5 75@ 6 00	Georges C'k and Cumberland f. o. b. at Locust Point for shipping	@ 4 75
Shamokin R., or W. Ash	5 50@ 5 90		
Lykens Valley R A	5 65@ 5 85		

At Havre de Grace, Md.

Cargo prices for shipment *south* of Patapsco river, (drawback allowed of 2½c,)		Shamokin R., or W. Ash	$5 65@
		Lykens Valley R. A	5 65@
Wilkesbarre and Pittston W. Ash	$5 60@	Trevorton R. A	5 40@5 60

At Georgetown, D. C. and Alexandria, Va.

George's Creek and Cumberland f. o. b. $ @ 4 55

An advance of twenty cents per ton has recently been allowed boatmen on canal freights from Cumberland, and the price of coal correspondingly advanced

Prices of Gas Coals.

September 4, 1868.

PROVINCIAL. Duty, $1 25	Coarse. Gold.	Slack. Gold.	AMERICAN Currency	Coarse.	Slack.
Block House	$1 75	$ 75	Westmoreland Co	$8 00	$8 00
Gowrie	1 75	75	Despard Coal Co	8 25	8 00
Lingan	1 75	75	Penn	8 50	8 00
Sydney	2 13¾	1 71¼	Newburgh Orrel Gas	8 50	8 00
Picton	2 13¾	1 18¾	Delivered in New York.		
Little Glace Bay	1 75	1 00			
Caledonia	1 60	75			

Prices of Foreign Coals.

Duty $1.25 per ton.

Corrected weekly by PARMELEE BROS., 32 Pine Street, N. Y.

Liverpool Gas Caking	$ 9 50	Liverpool House Canal	18 00@19 00
" " Cannel	14 00	" " Orrel	16 00@18 00

Per ton 2240 lbs., Ex. ship.

PRICES FROM YARD

Liverpool House Orrel, scr'l.	$18@20	Liv'l House Can'l, scr'l.	22 00@— —

per ton 2000 lbs. delivered.

Coal Freights.

(Corrected Weekly.)

Rates of Freight from Newburgh

RIVER.

On "Pittston" Coal, by boats and barges of the Pennsylvania Coal Company, per ton of 2,240 lbs.

Troy and West Troy	$ 55
Albany and Greenbush	50
Coeymans	45
Coxsackie and Stuyvesant	40
Hudson & Catskill	35
Saugerties and Barrytown	35
Rhinebeck and Rondout	30
Po'keepsie and New Paltz Land.	25
Fishkill Landing	20
Cold Spring and West Point	30
Peekskill	40
Haverstraw	45
Sing Sing and Nyack	60
Tarrytown and Piermont	50
Yonkers	55

The Coal must be discharged with all reasonable dispatch, at the expense of the consignee, who shall also pay wharfage on the boat. Boatmen will tend guy while unloading.

EASTERN.

Stamford	$1 25
Norwalk	1 25
Bridgeport	1 25
New Haven	1 25
New London	1 40
Norwich	1 50
Mystic	1 45
Stonington	1 45
Sag Harbor	1 45
Bristol	1 55
Newport	1 55
Fall River	1 55
Providence	1 60
Dighton	1 60
Warren	1 60
Pawtucket	1 75
New Bedford	1 90
Boston	2 15
East Cambridge	2 25
Salem	2 15
Newburyport	2 25
Portsmouth	2 25
Portland	2 00

Freights on Coal Sea-borne from Port Richmond, Philadelphia.

Sept. 10, 1868.—From Philadelphia & Reading Railroad Wharves, Phila., to

Boston	2 35	2 50	New York	1 25@$1 30	
Providence	— —	2 00	Brooklyn	1 25	1 30
Lynn	2 50	— —	Pawtucket	2 15	— —
Portland	2 00	2 50	Bangor	2 50	— —
Beverly	2 50	— —	Kittery	2 50	— —
Chelsea	2 50	— —	Cohasset	2 60	— —
Charlestown	2 50	— —	East Cambridge	2 50	— —
Cambridgeport	2 50	— —	Hyann's	2 50	— —
Fall River	2 00	— —	Newberryport	2 50	— —
Hingham	2 75	— —	Salisbury	2 50	2 90
New Bedford	2 00	— —	Allen's Point	2 00	— —
Roxbury	2 50	2 75	Norwalk	1 80	— —
Salem	2 50	— —	Williamsburg	1 30	— —
Newport	2 00	— —			

From Elizabethport and Port Johnston.

Albany	$ 85@	— —	New London	$1 15	— —
Boston	2 00	— —	Newport	1 40	— —
Bridgeport	1 00	— —	New York	60	— —
Fall River	1 45	— —	Norwalk	1 00	— —
Hartford	1 50	— —	Norwich	1 35	— —
Hudson	1 00	— —	Pawtucket and towing	1 60	— —
Wareham	1 55	— —	Portland	1 90	— —
Middletown	1 25	— —	Portsmouth	2 10	— —
New Bedford	1 50	— —	Providence	1 40	— —
Newburyport	2 15	— —	Salem	1 75	— —
New Haven	1 00	— —	Augusta	2 25	— —

Rates of Transportation to Tide Water.

[BY RAILROAD.]

To Port Richmond.—(Philadelphia.)

Philadelphia and Reading R. R. from Schuylkill Haven $2 00

The following are the drawbacks allowed on all coal shipped East of New Brunswick and South of Cape Henry, until further notice :

	Drawback.	Freight.	Nett.
Lump	85	$2 00	$1 15
Steamboat	85	2 00	1 15
Broken	50	2 00	1 50
Egg	50	2 00	1 50
Stove	25	2 00	1 75
Chestnut	40	2 00	1 60

From Port Carbon, 8 cents per ton more.

To Elizabethport.

L. V. Railroad from Mauch Chunk to Easton	$ 8[illegible]
C. R. R., N. J., Easton to Elizabethport	1 2[illegible]
	[illegible]
Shipping Expenses at Elizabethport	2 5
Total	2

To Port Johnson.

L. V. R R	$ 1
C. R R of N. J	1[illegible] 9
Shipping Expenses	2[illegible]
Total	2 35

To Hoboken.

L. V. R.R	81
Morris & Essex R.R	1 29
Shipping Expenses	25
Total	2 35

[BY CANAL.]

To Port Richmond.

From Schuylkill Haven to Port Richmond	$1 00
Freights and tolls by Raritan Canal	1 90
	2 90
Drawback	30
Total	2 60

To New York.

From Mauch Chunk to New Brunswick, by Lehigh, Del. Div. and Del. & Raritan Canal	$ 90
Freights through	1 25
Towage	20
	2 35

To New York via Morris Canal.

Lehigh Canal	$ 34
Morris "	40
Towage	10
Freight	1 55
Total	2 39

Expenses from Mauch Chunk to Jersey City for Re-shipment.

Lehigh tolls (net)	$ 34
Morris "	34
Freight	1 50
Re shipping	30
Total	2 48

Provincial Freights.

TO NEW YORK.		TO BOSTON.	
Sydney	3 50	Sydney	$2 75
Lingan	....	Lingan	2 05
Cow Bay	4 50	Cow Bay	....
Port Calidonia	4 25	Port Calidonia	3 00
Little Glace Bay	4 00	Little Glace Bay	2 75

Foreign Freights.

New Castle and Ports on Tyne	£13@15 keel,
Liverpool	12s. 6d.@15s. ton

San Francisco Coal Trade.

SAN FRANCISCO, CAL., Aug. 14, 1868.

Imports of Bituminous from Australia continue liberal, a considerable portion of which is placed before arrival, leaving little to be sold upon which to predicate quotations for the day. The 560 tons per Clan Alpine and 535 tons per Artemesia, sold prior to their receipt, and 600 tons per Haversham sold upon terms withheld. The 200 tons Lehigh, and 100 tons Cumberland ex Blue Jacket, was ordered from the East by a dealer for his own jobbing trade. The invoice of Scranton, ex Dexter, before reported, sold we believe at or about $14 75 per ton. Cumberland in cask is scarce, and wanted at full rates. Our quotations will be found to approximate cargo rates now ruling.

Australian	9 50@10	..	Lehigh	15 50	16 00
do. Wallsend	10 00	10 50	Liverpool	13 00	.. ..
Bellingham Bay	11 00	.. ..	Pittston, ton	14 50	15 00
California	7 00	9 00	Scranton	14 00	15 00
Cumberland cks	30 00	32 ..	Scotch	13 00	.. ..
do. bulk	28 00	.. ..	Vancouver Island	12 50	.. ..
Chili	10 00	.. ..			

SAN FRANCISCO STOCK MARKET.

A Telegram from San Francisco, dated Sept. 9, quotes :

STOCKS.	Bid per ft.		STOCKS.	Bid per ft	
Gould & Curry	94	@ 98	Belcher	160	@ —
Savage (per share)	95	@ 99	Uncle Sam	..	@ ..
Chollar Potosi	154	@ 159	Amador	..	@ 253
Ophir	..	@ 18	Imperial (per share)	..	@ ..
Hale & Norcross	52	@ 53	Alpha	..	@ 50
Crown Point	67	@ 69	Kentuck (per share)	411	@ 413
Yellow Jacket	1,260	@1,275	Cal. Steam Nav'n Co.	..	@ ..

New York Imports of Metals, &c.

The following will show the imports of Metals, &c., at the port of New York from foreign ports, for the week ending Sept. 4, 1868. The quantity is given in packages, unless otherwise specified.

Metals, &c.	Quantity.	Value.	Metals, &c.	Quantity.	Value.
Anvils	166	1 520	Metal Goods	128	19,647
Brass Goods	9	945	Nails	9	114
Bronzes	16	3,529	Needles	7	4,843
Chains & Anchors	81	4.149	Nickel	16	9.692
Cutlery	84	31.106	Old Metal	..	5,506
Guns	29	6,857	Platina	1	1,422
Hardware	96	17,055	Percussion Caps	13	2,603
Iron, hoop, tons	61	2 548	Saddlery	3	567
Iron, Pig, tons	400	5,445	Steel	8,237 lb	75,960
Iron, Railroad bars	16,473	92,106	Spelter lb	54,522	2,363
Iron, sheet, tons	45	2,987	Silver Ware	1	1,332
Iron, tubes	724	2,015	Tin, boxes	16,164	99,762
Iron, other, tons	1,974	50,977	Tin slabs	500	7,011
Lead, Pigs	5,973	30,556	Wire	4	1,989

☞ We understand that while some men were engaged in digging a well on the premises of Wm. Engel, Jr., at Buchananville, in Pottsgrove township, Pa., about two miles from Pottstown, they struck upon a vein or deposit of anthracite coal and slate. The specimens taken out were found 10 to 20 per cent. of pure coal, and the balance a fine article of slate. The digging thus far has not gone through the strata, and it is possible that further developments may prove the coal vein a valuable one.

☞ A correspondent of the Cairo (Ill.) *Democrat* sends an account of an iron mountain in Southern Illinois. The writer claims it to be as rich as the Missouri ore, and in inexhaustible quantities. It is not a circular mountain, but an elevated ridge, extending for a distance of five miles, all the way ore is to be found cropping out. The ore has been tested, and yields a per centage of 60 or 70 per cent. The mountain is only two miles from the Illinois Central Railroad, which will open for it a good avenue.

AMERICAN

Journal of Mining.

WESTERN & COMPANY, PROPRIETORS.

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☞ Mr. T. P. PEMBERTON is Editor of the Mechanical Department and Agent for the JOURNAL OF MINING.

☞ Correspondents, exchanges and others addressing us should be *extremely careful* to write "JOURNAL OF MINING," instead of "MINING JOURNAL," and to give the number of our Box at the Post Office, which is 5969, to ensure safe carriage. Communications intended for publication should be plainly written, and on one side of the paper only.

NEW YORK, SATURDAY, SEPTEMBER 12.

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NOTICE TO CORRESPONDENTS.

In consequence of a new regulation recently adopted by the Postmaster of this city to facilitate the early delivery of mail matter, we have to request our correspondents, in addressing us, to give the number of our post-office box, No. 5,969, in lieu of, or in connection with our business office address.

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LATENT HEAT OF VAPORS.

When a liquid substance is converted into vapor, the change in its physical condition is much greater than when a solid body is converted into a liquid. In the last case there is scarcely any change of volume or density; in the first instance the increase in volume is enormous, and amounts to many hundred times the original bulk. From these facts it may be anticipated that the amount of latent heat absorbed by an evaporating substance must be much larger than that absorbed by a melting solid, and this is, indeed, the case.

Water, for instance, when it assumes the form of vapor or steam, by means of an application of heat, increases its bulk one thousand seven hundred times; and, moreover, one pound of water will absorb as many as one thousand units of heat when it is converted into steam. Or, to express this law in other words, we may say that to evaporate one pound of water, it would require the application of as much heat as is necessary to raise the temperature of one thousand pounds one degree, one hundred pounds ten degrees, or ten pounds one hundred degrees. But we cannot say, in the same manner, one pound one thousand degrees, since that is a practical impossibility. This method of reasoning shows, at the same time, the absurdity of the statements made in the older text books on chemistry, that the latent heat of steam is one thousand degrees Fahrenheit. Such a statement causes misconception and confusion in the mind of the student. On account of the ignorance of many compilers of text books on natural philosophy and chemistry, we find the expression, even now, in some of our quite recently published works.

The best method of determining the latent heat of vapors, is the first one described on page 152, for finding the latent heat of liquids, or heat of fusion. We take a vessel containing one pound of ice-cold water, and place it over a constant source of heat. Suppose, now, this source of heat is so regulated as to raise the temperature of this pound of water ten degrees every minute; then, in eighteen minutes, the temperature will have reached $32+10\times18=212°$ Fahrenheit, the boiling point. If, now, we continue the supply of heat, and let the water boil away, we shall find that in eighteen minutes more, nearly one fifth of the water will have been boiled away, or, in other words, been converted into steam. Experiments show us that this steam possesses the same temperature as the boiling water. Since, now, in every eighteen minutes, one hundred and eighty units of heat have been produced, there will have been produced, in five and a half times eighteen minutes, five and a half times one hundred and eighty units of heat, or nine hundred and ninety units, for which, in round numbers, 1,000 is usually adopted.

The following table shows the latent heat by equal weight and volume of several different vapors, together with their specific gravity, and also the specific gravities and boiling points of the liquids from which they are obtained:

LIQUIDS.	Latent heat by equal weight.	Latent heat by equal volume.	Specific gravity of air-vapor.	Specific grav. of liquid.	Boiling point of liquid.
Water	1,000 units.	600 units.	0.45	1	212°
Alcohol	390 "	630 "	1.25	0.8	176°
Ether	160 "	475 "	2.26	0.71	95°
Oil of turpentine.	140 "	550 "	3.21	0.99	311°
Oil of lemons	150 "	....	....	0.85	340

The small amount of latent heat required to evapoaate alcohol, and still less amount for ether or turpentine, (160 and 140 units,) compared with that of water (1,000 units,) has suggested the idea that great economy in fuel might result from substituting ether for the water used in steam boilers. In accordance with this idea several years ago a large experimental ether engine was built at the Novelty Works, New York. Practical difficulties of an insurmountable character caused the utter failure of the experiment. The vapors of ether would, however, have been found to possess no advantages over that of water, even if the practical difficulties could have been surmounted, since, as appears from the above table, the vapors possessing the least amount of latent heat, have the greatest specific gravity, and consequently the least bulk. Moreover calculation shows—as well for other liquids not included in the above table—that nearly the same volume or bulk of vapor is produced by the same expenditure of heat or fuel, whatever be the liquid employed, and that there exists only a very slight advantage in favor of ether.

There is another way of determining the latent heat of vapor, namely, the rise in temperature of a known quantity of water used in condensing or liquifying a quantity of vapor produced from any liquid by the usual method, in a retort. The complete exposition of this method would, however, require calculations for which we have no space, and the above is certainly sufficient to place the subject in a clear light.

NOTES ON IRON PUDDLING.

Although we are just now entering upon the "Age of Steel," there seems to be no lack of attention in some quarters in regard to the puddling of iron. This is, indeed, a natural consequence, for however extended the use of cast steel for purposes of construction may be in the end, the production of wrough iron, and also puddled steel for certain peculiar purposes will continue to hold an important place among the various branches of metallurgical industry. Although the chemical principles involved in the process of iron puddling are of a very interesting character, it is, nevertheless, a noted fact that hitherto but very little attention has been paid to them. The work of puddling seems, as it were, to have been handed down from father to son, success therein having been based on the carrying out of a certain practical routine with no regard whatever to the chemical laws underlying the procedure. But it is not every "time-honored practice" that is susceptible of no improvement. In this view C. W. SIEMANS, F.R.S., has been making a thorough investigation of the chemical principles that obtain in the above process. An article from his pen lately read before the British Association at Norwich, is a most valuable contribution to the very scanty scientific literature upon that very important subject. The paper contains some interesting conclusions in regard to the elimination of silicon, carbon, sulphur, and phosphorus from pigiron by means of the puddling process. In reference to this matter it is observed "that most valuable valuable information has been supplied by a series of analyses of the contents of a puddling furnace during the different stages of the process. These prove that the molten pig metal is mixed intimately in the first place with a molten portion of the oxides (or cinder) which forms the lining (or protecting covering) to the cast iron tray of the puddling chamber; that the silicon is first separated from the iron, that the carbon only leaves the iron during the "boil" or period of ebullition; and that the sulphur and phosphorous separate last of all while the metal is "coming to nature."

Other investigations have been made by eminent scientific men confirming these results, and it is suggested "that they have only to be followed up and supplemented by some additional chemical facts and observations, in order to render the puddling process perfectly intelligible, and to bring into relief the defective manner in which it is at present put into practice, involving, as it does, great loss of metal, waste of fuel, and of human labor, and an imperfect separation of the two hurtful ingredients, sulphur and phosphorus."

The following views entertained by the writer of the article in question in regard to the chemical laws that control in the removal of the injurious elements are so important and generally interesting, that we feel disposed to give them in full. He says, first, touching the elimination of the silicon, that "in forming (by means of the rabble) an intimate mechanical mixture between the fluid cast metal and the cinder, the silicon contained in the iron is brought into intimate contact with metallic oxide, being found afterwards in the form of silicic acid (combined with oxide of iron) it follows that it must have reduced its equivalent of iron from the cinder to the metallic state."

Touching the necessary reduction of the comparatively large percentage of carbon contained in pig metal in order to bring it into a malleable state, it is remarked that "the disappearance of the carbon from the metal is accompanied by violent ebullition and the appearance of carbonic oxide, which in rising in innumerable bubbles to the surface of the bath, burns with the blue flame peculiar to that gas.

"It is popularly believed that the oxygen acting upon the carbon of the metal is derived directly from the flame, which should, on that account, be made to contain an excess of oxygen, but the very appearance of the process proves that the combination between the carbon and oxygen does not take place on the surface, but throughout the body of the fluid mass, and must be attributed to the reaction of the carbon upon the fluid cinder in separating from it metallic iron.

"But it has been argued that, although the reaction takes place below the surface, the oxygen may, nevertheless, be derived from the flame which may oxidise the flame on the surface, and become transferred to the carbon at the bottom, in consequence of the general agitation of the mass.

"This view I am, however, in a position to disprove by my recent experience of melting cast steel upon the open flame bed of a furnace, having invariably observed that no oxidation of the unprotected *fluid metal* takes place so long as it contains carbon in however slight a proportion.

"Supported by this observation, I feel convinced that the oxidising action of the flame in a puddling furnace commences only after the malleable iron has been already formed."

As regards the elimination of the other two very injurious elements, sulphur and phosphorus, nearly always present in greater or less degree, and of a very obstinate character as regards their removal, the paper says:

"It has been asserted by PERCY that the separation of these ingredients is due to *liquation*. This, I understand, to mean that the crystals of metallic iron, which form throughout the boiling mass when the metal "comes to nature," excludes foreign substances in the same way that the ice formed upon sea-water excludes the *salt*, and yields sweet water when re-melted.

"According to this view, pig metal of inferior quality will really yield iron almost chemically pure, to which foreign ingredients are again added by mechanical admixture with the surrounding cinder, or semi-reduced metal.

"It may be safely inferred that the amount of impurities thus taken up will mainly depend upon the *temperature*, which should be high, in order to ensure perfect fluidity, or complete separation of the cinder."

Basing his conclusions upon the above chemical considerations it is the opinion of Mr. SIEMENS that the practice of puddling as hitherto carried on, has been an extremely wasteful one, not only as regards iron but also fuel, moreover, immensely laborious and producing a metal only imperfectly separated from its impurities. It is to be hoped that, while this foreign investigator is endeavoring to bring about, if not a revolution, at least a thorough and permanent improvement, in the process of puddling, our iron men at home will not fail to keep pace with him in the practical application of the results of scientific research.

ACCIDENTS IN MINES.

Our exchanges from the mining regions are telling us of the continued and alarming recurrence of accidents in the mines. Indeed, the frequency of fatal casualties has become so great as to render it an imperative duty for those in power to make some regulations by means of which they may be lessened, if not wholly prevented. These numerous accidents are, of course, in a great many instances, brought about through the carelessness, recklessness and negligence of both overseers and miners. Various means have been suggested in order to prevent the frequent recurrence of accidents It has been proposed that the coroner make a careful selection of juries, and instruct them to make searching inquiry into the cause of casualties resulting in death, so as to find out where the blame lies, and in the end mete out a merited punishment to the guilty. Again it is suggested that Grand Juries should take cognizance of them, and that the officers of mines should take the greatest care possible—should be ever on the alert, as regards the machinery of the mines. It is, however, our opinion, as also that of others, that an inspector for each

mining district, invested with proper authority, should be appointed. It should be his duty to visit all the mines within his district as often as the necessities of the case demand; he should inspect, from time to time, all the mining machinery, and approve or condemn, as the case may be. With proper laws enacted by the Government touching upon this matter, with competent inspectors, with careful examination on the part of local authorities, and a swift punishment meted out upon the guilty parties, and with the proper rules established by, and a proper vigilance exerted on the part of superintendents and other subordinate officers, we have no doubt that the long list of accidents which are continually attracting our attention would, if not wholly, at least in a great measure, disappear.

EDITORIAL CORRESPONDENCE.—NO. XVII.

THE VALLEYS OF EASTERN NEVADA.

AUSTIN, Aug. 15, 1868.

Like a great many other so-called deserts, the Great American Desert is not so bad as it is painted. There are spots in it which seem to be forsaken alike of nature and of man; but a greater part of the sage-brush country—yes, even the Alkali county—is inhabitable, and capable of sustaining a rural populatien. Even Nevada, in an agricultural point of view, perhaps at present the most forbidding of all the States, will ere long supply her own people with the necessaries of life.

Surveyor General SAFFORD, of Virginia City, kindly allowed us to peruse the manuscript of a letter which he has sent to the General Land Office at Washington, in reply to a circular of inquiry, addressed to the various Surveyor Generals of the Pacific States, relating to the character and value of the agricultural public lands. The statements of Mr. SAFFORD are confirmed by our own observation. If we recollect aright, he divides the lands of Nevada into three classes; those that are absolutely worthless, (say one-third of the whole area); those which could be made productive by irrigation; and those which may be occupied as ranches without irrigation. The latter class is far more abundant than a casual observer might suppose. The history of Eastern Nevada furnishes a curious illustration of this fact. For the first year or two after the country was opened by the pioneers (of course we mean the miners, the miner is your true pioneer of civilization in this land; the trapper is only the shadow of the retreating savages), it was thought impossible to keep the stock (here we do *not* mean mining stock, which, goodness knows! it is easy enough to keep!) in these mountains through the winter. Now horses and cattle of all kinds are turned out for the winter, and actually fatten on the white sage and the "bunch grass." The latter is a product remarkably adapted to this climate. It starts very early—as soon as the snow disappears from the valleys—comes speedily to maturity; and, when the rains cease, wisely dries up, and turns into a nutritious, standing hay. Its most useful peculiarity is the tenacity with which it clings to its seeds, which (in the variety known as sand-grass) are small dark grains, which the Indians thresh out and convert into bread, and which cattle devour with avidity, even digging in the snow, sometimes, to obtain them. This grass grows in bunches, almost as if planted in hills, and the traveller may frequently discern at a great distance patches of these bunches, sometimes several square miles in extent, contesting with the sage-brush the occupation of the arid soil, and forming, with their light straw-color, a striking contrast to the dusty green and gray of the latter. We should think this grass might be cultivated with success on many sandy soils of the East, and would convert useless waste lands into valuable pastures. On the other hand, it is likely that winter wheat and barley would do pretty well on some of the land here, even without artificial irrigation, since they would escape the destructive effects of the dryest season. At present there are many ranches in the valleys of Nevada, where stock-raising, haying, a little cultivation of grains, and a little dairy-work, are carried on with success.

Smoky Valley, through which we recently made a journey to Twin River and Belmont, is by no means one of the most fertile; yet even there we observed many indications of possible future productiveness. Smoky Valley, or rather that vast valley, part of which is called by that name, is one of the most remarkable natural highways in the world.

As our readers are aware, the topography of Central and Eastern Nevada is formed by a succession of valleys, separated by meridional ranges of mountains. In travelling Eastward from Virginia City, by the overland road, the stage, for days together, alternately climbs over these ranges, or traverses, often enveloped in clouds of irritating and suffocating alkaline dust, the level lands between. Now the remarkable thing about these valleys is, that they are not connected with one another. Each has its own water-system, and its own level. Smoky Valley lies much lower than Reese River Valley, yet there is no water flowing from one into the other. They are rather like terraces than ordinary river valleys. Frequently they do not contain any main streams at all; when they do, it is merely the snow-water from the mountains which unites in the centre of the lower lands. All the rivers, creeks, brooks and springs, finally stop short, and "sink"—that is, spread into pools, and disappear, partly by absorption into the porous soil, and partly by the rapid co-operation induced by this dry and ever-shifting air. That evaporation has a great deal to do with this phenomenon, may easily be proved. In Smoky Valley, for instance, which has no river, almost all the tributaries from the mountains "sink" before they can find their way to the middle of the vast plain. One or two, like "Summit Creek," attain the barren honor of reaching the goal, and ignominiously disappearing in a puddle there. But if you ride along the road in the early morning, you will find many a musical brook of clear, cold water rippling across the way, and, with vain ambition, attempting the passage through the desert, through which you can trace its path for miles by the livelier green of the brush, or perhaps by a scanty fringe of willows along its banks. Return in the afternoon and the same channel will be as dry as though it had forgotten the taste of water. Yet the snows above are melting abundantly, and the soil cannot absorb more at one time than another. It is only the thirsty sun, making a straw of the atmosphere, and a multitudinous sherry-cobbler of all the streams in the great bowel of the desert. It is indeed a drinking-cup worthy of Phœbus, though all too ponderous for the delicate Hebe to bear. Fringed about its massy rim with pines, and crowned with snowy wreaths, whence trickles through a hundred shadowy clefts the cool, sweet nectar of the gods—what wonder that the eager drinker will not wait, but sucks up the refreshing draught, while yet it seeks the bottom of the bowl?

But the sun is none of your half-dead, parched fellows, that will drink anything. What he don't like, he leaves. You may see his heel-taps all along the valley. The ground is covered in many places with efflorescence of alkaline salts, which the celestial *bon vivant* has left in disdain. When water falls upon such ground, it settles into dark brown pools, such as collect from the lye-tub of a New England housewife. These alkaline deposits have not, thus far, been put to human use. They seem to be alike despised of heaven and men. Far otherwise is it with the salt-marshes, which are formed in a similar manner—that is, by the evaporation of saline springs. These are eagerly occupied, and the salt is obtained and sold to the quartz-mills, where it is used in chlorinating the sulphuretted silver ores, to prepare them for amalgamation. The manner of obtaining the salt is very simple. It is *shaved* from the smoothed surface of the ground, and packed in sacks for transportation. In a short time there is a new coating of salt on the same ground. Experience has shown that more is obtained by frequent gathering in this manner, than by waiting for a greater depth of salt to accumulate. The product is of course not pure. It contains many alkaline salts; and, from the color which we observed in some of the flames of the reverberatories, we believe that considerable chloride of potassium is mixed with the chloride of sodium. In purchasing salt, however, the mill-men only care to know what proportion of chlorine it contains; and on this basis the price is regulated. Some of the marsh-owners, we believe, have attempted to refine their salt by boiling or by re-solution and evaporation—but we doubt whether the manufacture could be made profitable. The impurities in the salt are not known to be greatly injurious in the furnaces; and the mills would hardly be willing to pay more *in proportion* for their chlorides, for the sake of getting them pure.

When we began this letter, we intended to give a description, not wise and instructive, but lively and personal, not of the valleys of Nevada in general, but of Smoky Valley in particular, and our delightful experience within it. Riding through that great highway, which extends from the Humboldt to the Colorado, galloping wildly over the sage-brush upon our gallant little steed, whose every step was a leap; admiring the mighty walls of granite, porphyry, slate and trachyte which rise on either side the valley, stopping by the way at the uncouth little cabins of the ranchmen, where great haystacks, and stables full of horses, and scattered herds of cattle "look like business;" steaming ourselves at the rude bath-house of the "Hot Springs," whose waters, bubbling from the foot-hills at boiling heat, have already been found a sovereign remedy for numerous fleshly ills; entering the steep side canons—little Yosemites, every one; and finally climbing twenty-five hundred feet up through the wildest of them all, to a busy town, a clattering mill, and a real mine—these are experiences too memorable to be crowded into the last lines of a prosy epistle. Perhaps hereafter we may uncork the pocket-companion of memory, and let them bubble forth.

R.

NEW PUBLICATIONS.

THIS WEEK, *an Editor's Table*, conducted by A. J. H. DUGANNE J. J. Bonnet, General Agent, No. 34 Liberty street, New York city; per year, $5.00; per copy, ten cents. The first number of the first volume of this neatly arranged paper is before us. The fact that it is under the editorial charge of A. J. H. DUGANNE, so well and favorably known to the reading public, is, in itself, enough to insure its permanent success, and make it a welcome visitor in every family where real literary talent is at all appreciated. The paper is printed in large clear type, is of excellent material, and contains eleven full pages of interesting reading matter. It contains a large amount of choice original matter, while the selections are evidently made with great care from the writings of prominent authors. Critical notices of the literature of the day; glances at noteworthy facts in science and art; opinions; extracts from new publications, etc., make up another important part of this very readable paper. We notice another, and a somewhat new feature in the getting up of this weekly journal. Running along underneath its regular pages is to be found a first-class novel. This is, indeed, a novel feature, in contrast with our old-established literary papers, but withal, it seems to be in perfect harmony with its designs. There is such a general appearance of neatness in the manner in which the paper is gotten up, and at the same time such a beauty, purity, and strength in the character of the literary articles upon its pages, that we find ourselves attracted almost unconsciously toward it.

Original Papers.

PREPARED FOR THE AMERICAN JOURNAL OF MINING.

THE CHEMICAL EFFECT OF STEAM ON METALLIC SULPHIDES AT A HIGH TEMPERATURE.

NUMBER ONE.

BY DR. ADOLF OTT.

The experiments which have thus far been made by chemists and metallurgists on the decomposition of metallic sulphides by steam at a high temperature, have led to results which have awakened the hope that the desulphurization of metallic sulphides on a large scale, by the use of steam, might be simplified and brought to a higher state of perfection. Men of the profession have not, however, as yet, been able to make an extensive use of steam in the desulphurization of ores in quantities, as it is rather difficult to fulfill all the conditions under which the sulphur may be thus more thoroughly separated than by ordinary roasting, where the oxygen of the atmospheric air is particularly active.

Before we can enter more fully into the details of the practical application of steam in the roasting of ores and metallurgical products, we have to establish the behaviour of the respective metallic sulphides towards steam at a glowing heat. We therefore propose to communicate, in the first instance, the above mentioned experiments and their results.

1. Experiments which have been undertaken by PETTINSON,* on the effect of steam on galena at a high heat, have established the fact that steam is decomposed by glowing galena, the hydrogen combining with a part of the sulphur and forming sulphide of hydrogen, while the oxygen forms a sulphate of lead with a proportionate quantity of galena, whereby the latter is probably reduced to a sub-sulphide.

2. Galena, when subjected to the action of steam, either for itself or mixed with carbon, was found by JORDAN† to be very difficult to decompose. Sulphide of hydrogen and sulphurous acid were formed, also some yellow oxide of lead, and particles of sulphide of lead were carried away by the steam.

When galena was mixed with coal dust, and then treated with steam, a slow decomposition was found to take place. Much sulphide of hydrogen and a little sulphurous acid escaped, and the galena was sublimed in the form of blush-tinted, feathery crystals, which were composed of delicate cubes. On the undecomposed galena, small lead globules were found.

3. Experiments on the effect of steam on metals and metallic sulphides, etc., at high heat, by REGNAULT.‡ The author speaks, in the introduction of his excellent article, as follows, on the chemical process of the decomposition of steam by metallic sulphides:

"With a simple sulphide, the hydrogen of the steam will combine with the sulphur and form a sulphide of hydrogen, and its oxygen will combine with the metal, provided the same possesses an affinity for it at the temperature the experiment has been made. The oxide formed will still act on the non-decomposed sulphide, a new quantity of sulphur will be carried away as sulphurous acid, and pure metal will remain.

"As now the sulphurous acid and the sulphide of hydrogen are mixed together at a high temperature, they will decompose each other, and water and sulphur will be formed. The final results of the experiment are, therefore, metal, sulphur and undecomposed sulphide of hydrogen, when the metal itself is not capable of decomposing the water. In the latter case, an oxide will remain, which is formed when the metal is heated in a current of steam. The steam would accordingly play the part of a very powerful desulphurizing agent, in case the sulphides would decompose it with some energy; for the desulphurization would, in both cases, be effected at the same time by both elements of the water—the oxygen and the hydrogen.

"The effect is different when the sulphide is mixed with carbon, for a certain part of the steam is decomposed by the carbon. Oxide of iron is formed, which has no effect on the sulphides, and hydrogen is also generated, which, as HEINRICH ROSE has shown, abstracts the sulphur from a certain number of them. This process, however, occurs with difficulty, and slower than by oxygen. The steam remaining undecomposed is capable of acting upon the metallic sulphide, forming sulphide of hydrogen, but no oxide, for the reason that there is carbon present. No sulphur will consequently be separated by this method of reduction. Under these circumstances the desulphurization will, therefore, be delayed. The addition of coal cannot, therefore, be of any service in the process of desulphurization by steam, in case it is not applicable for itself, and it will only be of use in the end for reducing the metal in case this latter has been oxidized after the separation of the sulphur.

"If we pass a mixture of air and steam over a heated metallic sulphide, it is clear—as air and steam are without action upon each other—that each one will act independently of the other. The air will, therefore, act by means of its oxygen, as it does generally, while the steam will act as above indicated. Sulphurous acid and sulphide of hydrogen will be formed, which react on each other. The products of this latter reaction will be water and sulphur, while a certain surplus of the gas will remain. As regards the metal, it will be converted into an oxide."

* Erdman's Journal für technische und ökonomische Chemie, vol. V., p. 216. Extracted from Phil. Magazine and Annals, March, 1829.

† Erdman's Journal für technische und ökonomische Chemie, vol. XL., p. 348.

‡ Erdman's Journal für praktische Chemie, vol. X., p. 129.

WRITTEN FOR THE AMERICAN JOURNAL OF MINING.

THE AMMONOOSUC GOLD FIELD IN NEW HAMPSHIRE.

BY PROF. HENRY WURTZ, OF NEW YORK.

The chief object of this note is to place on record the history of the discovery of this new gold field, which has assumed so much importance that three gold mills have already

been erected in the immediate vicinity, to operate upon its ores.

While exploring for a Joint Stock Company, called the "New Hampshire Silver-Lead Company," whose property is located upon the S. E. slope, and along the base of Gardner's Mountain, in Lyman township, Grafton Co., N. H., the first discovery was vouchsafed to me of the existence of gold in the rocks of this section. The date of this was July, 1864.

The following extract from my report made to this company at the time, and published by them in a pamphlet form, will give an idea of the geological character of the range. After stating that the property, lying in the valley S. E. of Gardner's Mountain and running high up on its slope, lies upon a belt of crystalline schists, having a course about N. E. and S. W., and a S. E. dip of 45° or more, I proceed to say:

"These schists have, in most places, more or less of a talcose character, though in some places passing into a quartzose schist.

"The country is everywhere highly metalliferous, the indications of this being obvious to an experienced eye almost at first glance, in the very frequent occurrence of masses of honey-combed quartz, usually containing more or less limonite gozzan, indicating the past existence of metallic sulphurets. In some places a large percentage of the stones of which the fences are built are of this character.

"I, myself, picked out of a stone fence such a mass of quartz, still containing bunches of galena and blende.

"The schists themselves, in most places where exposed, are loaded with small particles of *limonite*, derived, as was seen in places where we blasted into it, from more or less thickly interspersed crystals of pyrites.

"In many places the ledges of schist were stained and encrusted with *limonite*.

"Everywhere throughout these schists were found seams and bunches of quartz, sometimes assuming the form of thick beds, conformable with the stratification, sometimes even that of fissure veins crossing the stratification at an angle.

"Such quartz was almost invariably accompanied by the well-known indications, of carrying, in depth, more or less of the metallic sulphurets, or ores; the particular ores observed, so far as opened, being common iron pyrites, copper pyrites, galena and blende."

After describing several other lodes upon the property; that in which the gold was first discovered, is then spoken of as follows:

"Orchard Vein No. 1 is of much more immediate interest. It was discovered twenty years since, in sinking a well for the farm-house. The well is about 18 feet deep, and this vein is sufficiently developed to enable some idea of its nature to be arrived at.

"There can be no doubt of this being a true fissure vein, somewhat irregular at the surface in its thickness and dip, but regular, so far as is known, in its course. There were taken out, besides large quantities of gozzan, many specimens of galena and blende, still undecomposed. Parts of the quartz showed a strongly-marked *comby* structure, so characteristic of true fissure veins. Much more was made out by descending into the well at E. Until within a few feet of the bottom, the quartz vein at that point was quite irregular, much branched, and divided by a large horse, the vein itself being mostly barren, though its walls were filled with large masses of rich-looking gozzan. Towards the bottom of the well, however, a change appeared, the vein becoming more regular, about two feet thick, with a steep dip to the southeast, carrying its of large quantities of gozzan, and its walls, which consisted above of a rotten, highly talcose schist, assuming here the character of *capels*, or becoming very compact, hard and quartzose, and becoming loaded with brilliant crystals of pyrites."

The farm-house spoken of belongs to what is known in the vicinity as the "Bailey Farm." To put the authenticity of this discovery and establish its date, beyond all cavil, I take the opportunity here to place on record the following assays made at my request, by DR. TORREY, of samples from this and other Gardner's Mountain lodes; No. 3, being the "Discovery Lode."

"UNITED STATES ASSAY OFFICE,
NEW YORK, August 2d, 1864.

"*To the New Hampshire Silver-Lead Company:*

"GENTLEMEN—Professor H. WURTZ has placed in my hands, for assay, three samples of galena, which were collected by him personally upon your property.

"I find them to give the following results:

No. 1,	per ton of 2,000 lbs. ore,	- -	Silver,	49.89 oz.
No. 2,	" " "	- -	"	31.89 "
No. 3,	" " "	Lead Ext.	"	56.95 "
		"	Gold,	1.006 "

Yours, respectfully,
JOHN TORREY, U. S. Assayer."

I will add that several assays made of the chalcopyrite, and of the gozzans derived from it gave no gold. The blende was not assayed, so that it remains yet undetermined whether this, also, as well as the galena, constitutes in this gold field an auriferous matrice.

Pyrrhotine is one of the predominant sulphids throughout this whole region. No gold was found by me in this either, at least from Gardner's Mountain. The wonderful results from the Lisbon ores, reported from Boston, were, I believe, in assays of pyrrhotine.

The report referred to concludes as follows:

"The discovery of gold, for the first time, in this part of New Hampshire, and in such important quantity, is of great interest, and encourages further examinations of the rocks and minerals upon your property for this metal.

"The assays of the galenas for gold as well as for silver, were instituted in consequence of the striking resemblance of this belt of talcose schists and its included veins to certain belts of the same rock, and their included veins, in the gold regions of North Carolina."

Another visit was made by me to the region some two months subsequently, and some further interesting facts were made out regarding its structure. Among other things it was observed that on proceeding from Gardner's Mountain southeasterly towards the Ammonoosuc, the S. E. dips were maintained for some distance up the slope of the high range of hills in Lyman township; changing then gradually to the N. W., indicating a synclinal axis passing along the N. W. slope of the Lyman Hills. In the neighborhood of the crest of these hills, or somewhat east thereof, an extensive sett of large quartz lodes was observed ranging, with N. W. dips, which was therefore judged to belong to the same horizon in the schists as those of Gardner's Mountain, brought upon the opposite slope of the trough; and I recommended at the time the careful exploration of this belt of outcrops.

It would appear that my words did not fall on barren soil, and four years have brought about a remarkably rapid development of the minerals of these districts. In fact, but little more than *two years* subsequent to this second visit, I found, on a third visit to the country (in December, 1866) that two gold mills had been erected, and several gold mines opened. One mill was at the base of Gardner's Mountain, on a lode belonging to the same sett in which the first discovery was made in 1864; (erected by a Hartford Co.) another (by a Boston Co.) at Lisbon, on the Ammonoosuc, built to operate on ores from an opening on a third belt east of the Ammonoosuc, assays of whose ores in Boston had yielded *fabulously* rich results, but which gave little or nothing, I am told, in the mill; and which is now, I believe abandoned. A new mill is now operating profitably (as reported) upon ores from mines opened upon the sett of outcrops above mentioned near the crest of the Lyman Hills, to which special attention was first directed by some prospector picking out of a stone fence, into which it had actually been built without noticing its precious contents, on what is called the "Dodge Farm," a quartzose mass about the size of a man's head, at least one-third of which was massive gold. This story becomes less incredible when it is stated that the gold was encrusted and hidden at first by oxyd of iron, and that the occurrence of ponderous surface-fragments loaded with galena is not uncommon on these hills. The specimen I speak of I have seen.

My friend, Prof. CHARLES HITCHCOCK, has recently paid a visit to this section, and informs me that an average yield is now reported, by actual mill process, at Lisbon, (where there are now two gold mills in operation,) from the ores mined upon this Dodge Farm and other localities on the Lyman Hills, of $12 to $14 per ton; which is highly encouraging. He also tells me, what is to me most surprising, and which is probably almost without precedent in the history of such discoveries, that the name of the discoverer is actually known to some of those who are reaping the advantage, and that there prevails in the neighborhood a tradition of my original explorations four years since, which have resulted in so much local benefit. This tradition has even reached the newspapers, in distorted and partial forms. For example, a New York daily (the *Tribune*) lately had a notice of the new gold field, in which the discovery was correctly located on the Bailey Farm, but the latter placed in Lisbon, instead of Lyman, and a further slight omission was also made of the name of the discoverer. In order to avoid misrepresentation, I wish now to say, that I observed features in the structure of these two setts of lodes in Lyman, and in their mineral contents, which will necessitate further examination and careful study to avert fruitless expenditure both in mining and in milling.

I shall here introduce another short extract from the pamphlet report already quoted, relating to the lodes which crop out along the S. E. slope of Gardner's Mountain, to wit:

"A very encouraging feature was the finding of many cavities or 'vugs,' lined with beautiful crystals of quartz, in some of which there was much gozzan, intermixed with decomposing crystals of galena and yellow copper. A feature of the greatest importance, and encouraging the expectation of *an increase of copper in depth*, was the generally clear and untarnished appearance of the few crystals of iron pyrites found, which shows the gozzans to have been chiefly, if not wholly, derived from copper pyrites.

"In fact, in some places gozzan was found distinctly passing into yellow copper, some specimens of which were brought back, so that the indications are quite strong that, in addition to the silver lead, an important quantity of copper will be found in depth on this lode."

At the same time a spot was pointed out by me, where the out-crop of another of these lodes crossed a brook on the Bailey Farm, with a rich show of copper pyrites, but public mention of this was suppressed in the report, by parties interested, with a view, ostensibly, of securing further mineral rights.

It has led, nevertheless, to an extensive exploration of this mountain slope for copper, and the opening of many highly-promising copper mines; and had not a swarm of speculators at once stepped in, and tied up almost every acre of the surrounding country with mineral leases and bonds, doubtless a highly productive and valuable copper mining region would soon be developed on Gardner's Mountain. I wish to add, that on my visit in 1866, I entered a tunnel 300 feet long, which had been opened by the "New Hampshire Silver-Lead Company (at a point some 1,200 feet distant, however, from the one advised by me,) and I found that they had apparently ceased exploring just where every evidence existed of having almost reached the hanging-wall of a lode cropping out on the mountain-side above, with good copper indications.

To return to the main subject of this note, I wish to suggest that the history of this gold field presents, probably for the first time, the peculiarities of a first discovery in the *solid rock*, and not, as usual, by the tracing up of gulch gold to its home in the lodes. In fact, as I am informed that gold has been since washed out of the sands of the streams in the Lyman Valley, we have here a complete *reversal* of the usual march of events in the development of a gold field.

Both the Lyman Hills and the S. E. flanks of Gardner's Mountain being drained by the Ammonoosuc and its tributaries, I assume the right of a discoverer in designating this region as "The Ammonoosuc Gold Field."

No. 26 PINE-STREET, New York, July 18, 1868.

Desiring that honor should rest where it is due, I have requested Professor HITCHCOCK to favor me with the following note, which I append with peculiar pleasure: S. W.

[NOTE BY C. H. HITCHCOCK.—It was my privilege, in 1858, to cross the auriferous formation described by Prof. WURTZ, a few miles above Lyman, and to publish, in 1861, in the final report upon the Geology of Vermont, a section crossing it, extending from Mount Washington to Lake Champlain. In this report the formation was called "talcose schist," and was regarded as of the same age with the rock further west, which had then yielded gold both in Vermont and Canada. In 1861 and 1862 I explored the northeastern section of this formation in Maine, and in the Second Annual Report upon the Geology of Maine, p. 349, drew the conclusion that the formation extended from Bellows Falls, in New Hampshire, to a point on the northern Maine boundary, not less than 340 miles distant. Since that time, Sir W. A. LOGAN has adopted the same view, and has represented the area as far south as northern New Hampshire, in his latest map, under the name of Quebec Group. No gold had ever been found in Coos or Grafton Counties, N. H., till it was found by Prof. WURTZ, in 1864, in the manner described above. C. H. HITCHCOCK.]

Correspondence.

[To insure insertion of correspondence in our columns, the full name and address of the writer must be given.]

From the Rocky Mountains.—No. I

EDITOR AMERICAN JOURNAL OF MINING:

The most striking fact presenting itself to the traveller across the American Continent, is the occurrence of three belts running North and South, into which it is divided.

From the East coast to the Mississippi the country was, or is, as a general rule, thickly wooded. The next region, so truthfully termed "prairie" by the old French settlers, extends from the Mississippi to 400 or 500 miles West, is generally fertile, covered with rich grass and entirely bare of trees, or even shrubs, except along the water courses. What the reason of the treeless nature of this tract is, has, I think, never been explained. I should hazard the supposition that it may be owing to the great breadth of the Continent at this point. The principal part of the moisture derived from the Atlantic is deposited East of the Mississippi, and that from the Pacific is caught by the numerous mountain ranges of the western coast, so that the resulting small amount of rain in this prairie land does not favor the growth of timber, though the grass and smaller plants grow most luxuriously. We see an example of the same sort in the interior of Asia and Africa. The alluvial nature of the prairie district may be imagined, when I say I did not observe a rock for 700 miles West of Chicago. The surface of this tract has probably been deposited by the Mississippi and Missouri and their tributaries, and the richness attains its maximum in Iowa, where the soil consists of a black loam from one to two feet deep. This will, at some future time, be the garden of America. The same description applies to the country between Chicago and the Mississippi, and from the Missouri 100 miles up the valley of the Platte, except that it is not so rich as Iowa. I have never seen any natural soil equalling this, in appearance at least.

The next class of country extends from about 200 miles east of the Rocky Mountains to near the Pacific, and has with reason been styled the great American desert. This cannot be cultivated except in isolated spots, or where irrigation can be applied. The plains are dry and barren, and only suited to stock farming. No trees or shrubs occur. A dry, stunted grass covers the surface. The mountain part of this region is the scene of the great mining operations on veins of the precious metals. The Rocky Mountains in Colorado are wooded, though the trees do not attain a luxuriant growth, seldom exceeding 1½ feet in diameter, and do not by any means cover all the mountain side. They consist, almost exclusively, of spruce and pine, with a few cedars. Considering the small amount of wood, the conduct of the inhabitants is reckless; as, besides the great consumption of timber in the mines and in steam and metallurgical operations, at least one-fourth of the forests that I could observe, had been burned down, and only blackened poles remained where trees formerly grew. Should the mines be worked on an extensive scale, there will not be timber for their consumption within 100 miles around, in 20 years. Trees are said to flourish when planted on the prairies, though I could see no evidence of this except in the case of the cottonwood, which they generally plant around the farmhouses, and, unfortunately, this is about the most worthless that could be grown. A strange fact is, that when the surface sod is dug off, young cottonwood plants will sprout up, though plants of that species may not exist within a great distance. Whether the seeds have lain dormant during ages, or were spontaneously produced by nature, would be an interesting question for a botanist to resolve. This want of timber is the only drawback to the capabilities of the great West, and more attention ought to be paid to it by Government, as belts of trees would break the cold winter blasts, and afford shade and shelter to cattle, afford useful timber, and probably increase the rain-fall. I think it would be very possible to effect this object on the prairie tracts, but utterly impossible on the plains. I have seen cottonwood and willows watered every day in Denver, and though these seem to be the only trees that will grow at all, they have the sickliest appearance.

The ferry across the Missouri at Omaha is a disgrace to a great line of communication. A small ferry boat steams in, and lays alongside the clayey banks, at either side, wherever she can. There is no floating pier, or other facility for adapting the passage of vehicles on board to the rise or fall of the water. The current is very rapid and muddy here, and the river rather narrow. The building of a railway bridge of which they talk, will doubtless offer great difficulties, and the foundation will probably have to be laid on screw piles sunk so deep into the clayey bottom, that the change of channel cannot affect them.

On leaving Omaha, the settlements extend at intervals up the valley of the Platte, for 70 or 80 miles, and then almost cease; the railroad then enters the Indian country, and houses, or rather huts, are only seen around the stations along the line, a small guard of soldiers being stationed at each. Covered ways are dug underground from the station to a small fort 100 yards in rear, through which the soldiers and others can retreat in case of a sudden attack of Indians. The houses are of a very original character, some being nearly altogether under ground, the flat roof only projecting a couple of feet above the surface, with port holes on each side. Some are built of boards, on the surface, but have always an embankment of earthwork thrown up against the walls nearly to the eaves to prevent bullets penetrating. The holes in the walls serve the double purpose of windows and portholes. The habitations present the most dismal appearance. Water

is raised from wells for the supply of the engines, etc., by pumps worked by windmills—which is a very good plan, where other motive power would be so expensive—this system is also a good deal used in Iowa for the same purpose.

The track has been laid on the Union Pacific Line, in the most temporary and economical manner. The gradients adopted are those of the prarie. I did not see a cutting or embankment, worthy of the name, from Omaha to Cheyenne, though I must say they are scarcely needed. The ties are filled in with earth, and this filling in does not extend beyond the end of the ties. I see no reason for the boast of laying four miles of track a day on such ground as this, as by having a sufficient number of men, the only difficulty would be in getting up material enough. One mile of average railroad in the east would cost more labor than four miles of this. The only bridge of consequence is that over the North Platte, which river is here a shallow stream, the channel being about a quarter mile wide. This pile bridge is of the most provisional character, and the train has to pass at a snail's pace. The whole road seems to have been got up more as a construction line for a future permanent one than anything else, and perhaps it is wise to make the communication between the oceans as rapidly as possible, even though it be by a provisional road; the permanent way can be made afterwards with comparative ease, from the facility afforded for carriage of materials by the present one. We ran the distance from Omaha to Cheyenne, 515 miles, in 24 hours, which is better time than the western roads make generally, but the stations are distant 15 or 20 miles from each other, and the level nature of the country renders the use of sharp curves unnecessary. Only one passenger train runs daily, but things must be very different when the connection is made with the Central Pacific, though it seems to me that the common idea that a good deal of the China trade will come over the road is unfounded. The saving of time could never make up for the immense increase of freight charges, except with very light and valuable articles. They charge about 7¼ cents a mile as passenger rates, and freight in proportion, on the Union Pacific Railroad. D. COGHLAN.

[We publish the above letter as giving expression to the views of Mr. COGHLAN in regard to the subjects he has been pleased to discuss. We are well aware that the views he entertains in regard to the origin of the prairies are those maintained by at least one distinguished geologist. It is, to us, however, a matter of grave doubt—the idea that lack of rain-fall has given rise to those natural meadows. We feel confident, indeed, that the amount of rain fall, judging from our own experience, is quite as great, if not greater, upon the prairies than in many heavily timbered regions of country. The feelings entertained by the correspondent in regard to the prospects of the Union Pacific Railway, are certainly not the most sanguine. We hope the road is to be something more than "provisional" in its character. It is not necessary that the road bed should always be without ballast. It is not probable that the pile bridge across the Platte will always be a pile bridge, nor, finally, is it our belief that rates of freight will always be so enormously high that we shall fail to get any of the China trade. It is our opinion, rather, that this so-called "provisional" road, in and for itself, will become, eventually, the great inter-oceanic road of the continent. It is a little shaky now; time will make it substantial. Cheap railways are with us, within certain limits, a necessity; or, if not a necessity, at least a great convenience. They are pioneer enterprises. We must have patience with them.]—ED.

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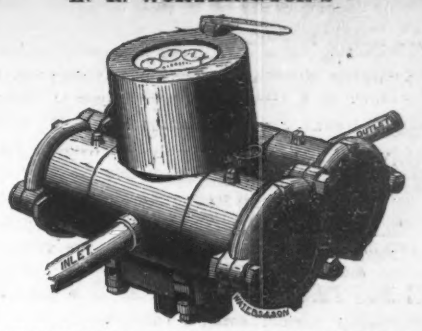

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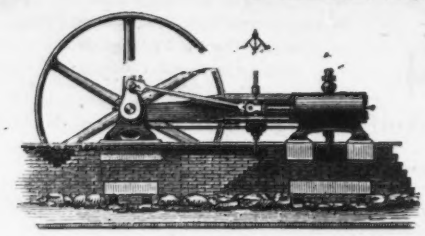

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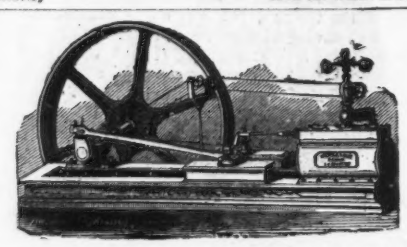

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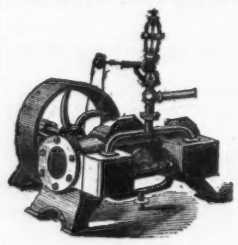

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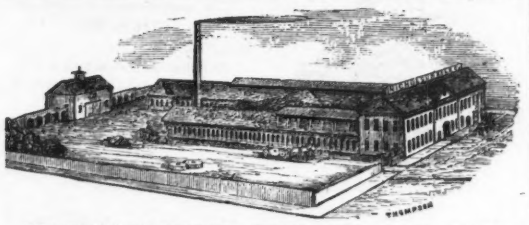

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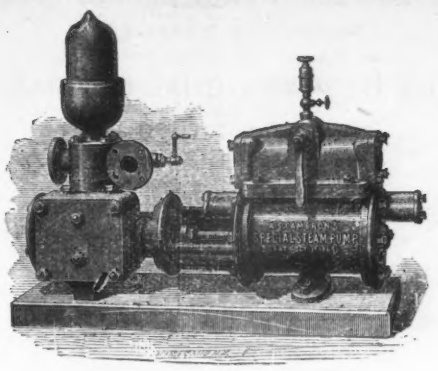

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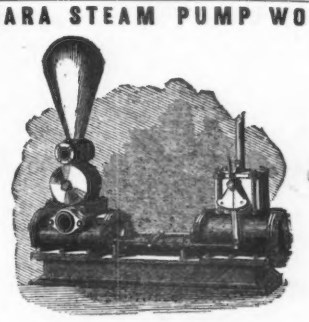

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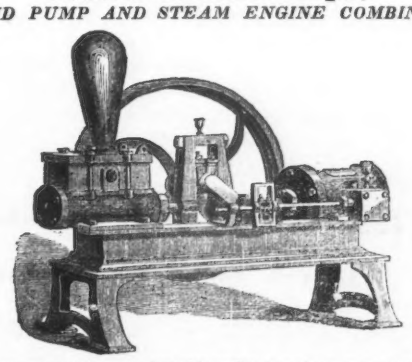

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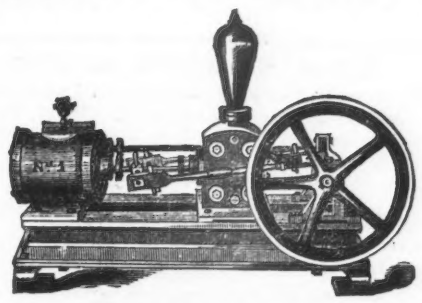

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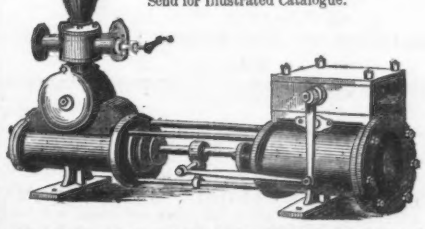

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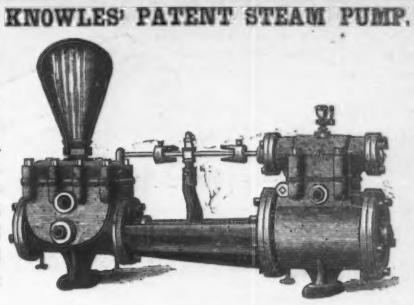

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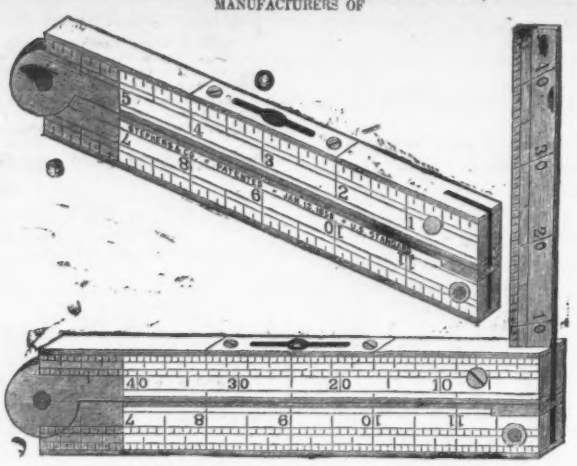

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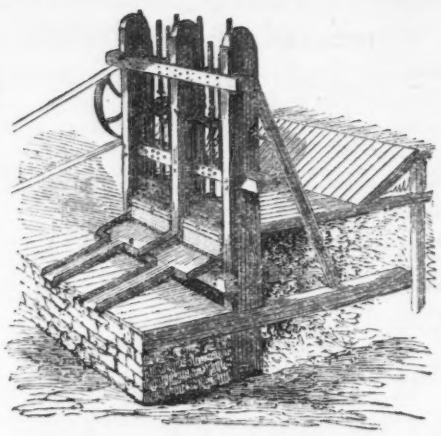

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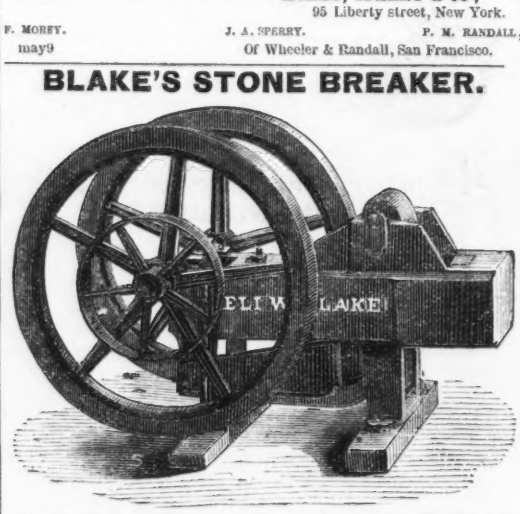

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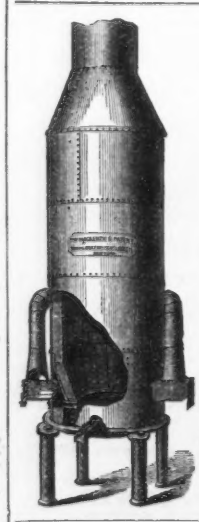

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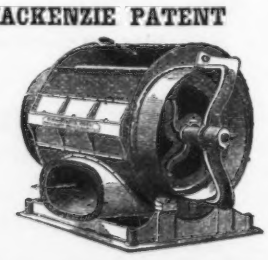

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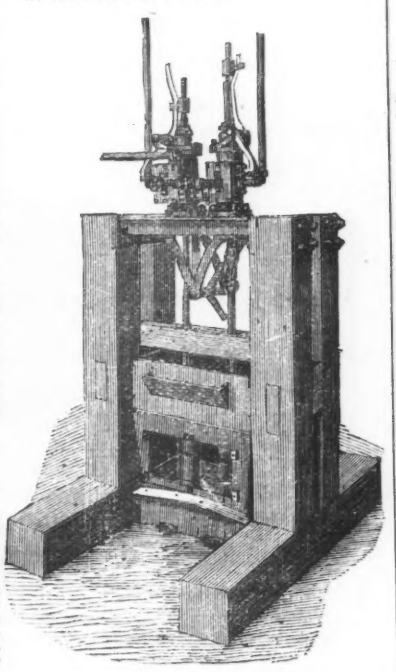

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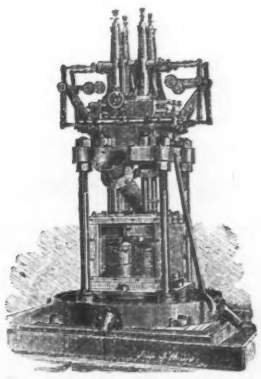

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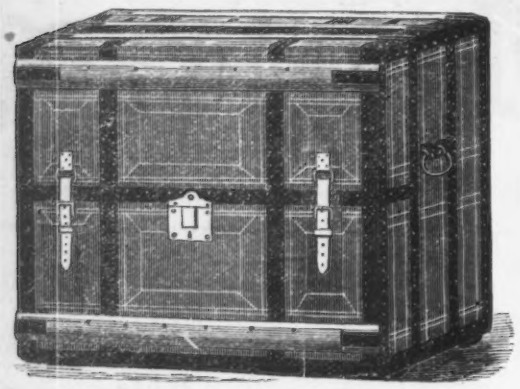

FIG. 1.

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FIG. 2.

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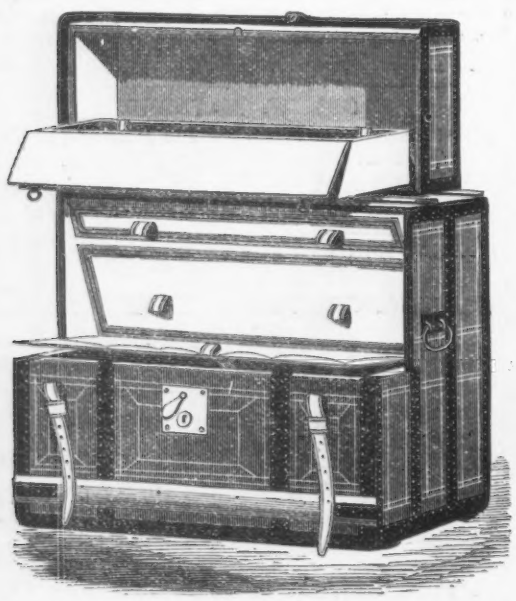

FIG. 3.

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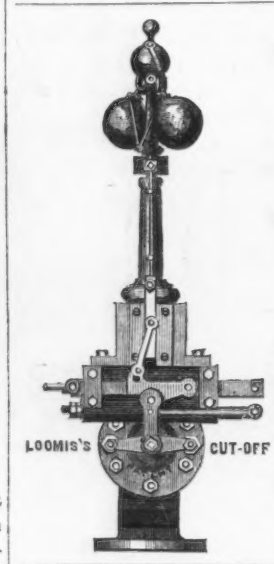

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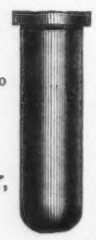

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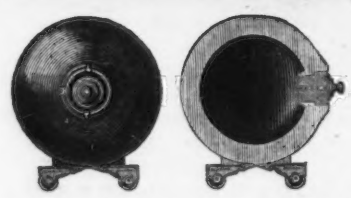

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